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Ensigns Peter Michael (left) and William (center) and Surgeon Peter (right) stand together in front of the ship's mast on February 4, 1961. They are the last three members of the ship's medical staff who served on the ship during its last voyage in 1961.

Editorial

One of the most exciting challenges of Service medicine is the chance that any of us may be called upon at short notice to provide medical cover where we least expect it and in unpredictable circumstances. The possibility is ever present that the General House medical officer called into an establishment job at home may suddenly be asked to demonstrate considerable versatility and resource in filling an urgent ongoing appointment at an unforeseen operational role overseas. Similarly the surgeon in a deployment team be prepared to deal with an outbreak of communicable poisoning or hepatitis, while the physician may find himself off balance and asked to cope with a water borne typhoid fever outbreak or a lightning fire of war during an RASC. Such examples, which have all occurred, mean that we must maintain a broad training base. At the same time if we are to uphold the professional standards we have set ourselves, we must train our specialist expertise.

In the second context it is vital to design our education in such a way that sources of specialist and perhaps rarely used knowledge are recorded and maintained long enough in time and that due thought is given to capture and accurate dissemination of information when it is required. This after all is the true concept in the wider context of the Service to a whole. Contingency plans then contain replacement updating and renewal and the method by which they will be rapidly

documented to those who need to have, are a permanent feature of Service life. Service authorities approximate the requirement to keep personnel data to the extent of values in equipment or action through regular entries given by specialists in the various railway and maritime fields.

The Royal Naval Medical Service is a small and costly operation in terms of personnel. We cannot afford the luxury of specialists who do not also practice more general medicine. Consider for example neurology: the volume of purely neural practice would seem best to be taken by a top specialist who covered nothing else; this in turn would lead to declassification and eventually poor recruitment, while the few units for treatment would be hard to justify. We need, therefore, for this field, a general physician with a special interest in neurology who is asked from time to time to apply to the rest of us on his subject-particular help as it applies to Service life. The alternative is to delegate this responsibility in toto to civilian consultants, in that case however consequences are obvious challenges, and despite the enormous fund of goodwill they bear towards the Service, those are few who can afford to give the time and the correct Navy priority, which is essential to maintain standards. This therefore is our reason of service as Service and the reason why we must take on the responsibility for such sub-specialisation ourselves. This is an entirely different concept from that of referral of a patient to a civilian consultant.

for a specialist opinion, a private time would have to be lost.

It is important that the fields of specialist expertise in military units that we need, are chosen carefully and identified positively so that they do not exceed our capability. Our intention must be to have specialists in the correct level both in scope and depth. They maintain their expertise and ensure their continuity. Without such forward planning we will inevitably revert to sporadic specialist visits that lack the foresight required of a fighting Service. The Services were in the company of those who studied the implications and importance of the planned progression to the new recommendations of the Royal College, it is to be hoped that our specialist qualifications are now recognised without question as civilian practice. We must retain the general flexibility in order to attract fresh blood of quality and to maintain the high standards we have achieved, but this alone is not enough to justify the Service concept of medicine.

Two types of basic self specialist requirements exist. There are those specialist fields which we require for everyday assistance in the Navy such as trauma surgery, endoscopy and its associated surgery and such the management of anaesthesia. In contrast there are areas of knowledge where specialised skill may be required in a military environment and we must encourage individuals to maintain this expertise despite lack of continuous application. Combat readiness care is in widest scope and numerous domains including biological warfare can be cited as true examples. The need to maintain some expertise in tropical medicine has recently been demonstrated when the Navy was asked to help in the Rhodesia/Zimbabwe crisis at short notice. On that occasion happily we were in a position to demonstrate the relevant information rapidly to these medical officers and on medical reports and thus produce a team at

short notice which was required to staff nearly half the assembly points on the bank. It is significant that the Army was not to receive expertise in this specialty.

Perhaps the question of rapid dissemination of specialist knowledge particularly requires attention. Availability of relevant civilian medical aids is largely lacking in operational subjects despite the fact that we have all the necessary equipment and have made a number of mistakes that on more general subjects. Nearly every ship in the Fleet has a radio cassette system of well proven value to the very near future and we must plan now how best to utilise this facility. Teaching sessions of quite high quality can be produced relatively cheaply and easily. These should be treated as our special needs by our own specialists for such basic subject shortcomings. One of the major criticisms identified in recent surveys of general amongst medical officers was the relative breakdown of communication with us the Branch from top to bottom and vice versa, perhaps this can be improved to a number of levels by using such systems. Other more orthodox means under current review include the content of New Navy Medical Officers training and the associated localised Handbook for Medical Officers at Sea.

A rough sample of years by shared in with industry, the NHS and the rest of the country, we must take positive steps to reduce training costs and increase efficiency. The hospitals and the operational experience they contain are tempting targets for sensible economies but let us not underestimate the devastating effect that this would have on our Service. Our study agreed that widely dispersed expertise will always be the forerunner for disaster except although it must be thoughtfully and perhaps sparingly applied in disaster with it is a false economy that can only lead to the Service to failure of healthy growth.

Cui Bono?

G. J. Miles Thompson

Science, by definition, is a profession in someone who takes to other people's things, it may be appropriate to question the desirability for a voluntary lecture, but such an address can serve some useful purpose. Finally, it gives me an opportunity to express my gratitude to many people with whom I have worked during the past five years, who in their various ways have made my life easier, happier and perhaps more meaningful. Secondly, it allows me to discuss the relevance of the research work in which I have been engaged and to attempt to answer the questions posed to me. Thirdly, it allows me to say something about the future.

The Chair of Naval Medicine established by the Royal College of Physicians and the Royal Navy lies in the shadow of famous men who have been physicians in our Service. Such a role would not be appropriate for me, as I take my leave to dwell on the achievements of past holders. Nor will I ponder the difficulties of the times and the problems confronting the nation and the Navy. I certainly cannot give an account of my stewardship. Perhaps in due course the perspectives of memory will place these five years where they belong, but now they have to be viewed from a position to show that complete clarity of vision is impossible.

A Professor of Naval Medicine must look

in two directions. His first duty is to the Service and to the patients of medical excellence therein. But to this end he must also look beyond the Service to the broad range of medical practice outside and beyond institutions in medicine never has and never will work, it is through the free interchange of concepts and discussion with the whole world of medicine that we are able to pursue the highest standards of patient care and of medical practice for the officers and men of the Fleet for their dependants and for those who have now retired.

In the course of the pursuit of questions the research programme with which I have been associated, first in Plymouth and subsequently at Bristol, has been undertaken with what some might consider to be excessive zeal. The circumstances in which I address you are some what different to those in which I have asked 'Cui Bono?' but the question 'Who benefits?' is a valid one. This lecture offers me an opportunity to describe the work we have been doing, to attempt to answer that question and to acknowledge my debt to those who have helped me along the way.

Nobody would dispute that it was Surgeon Vice Admiral Sir Isaac Witt who, as Professor of Naval Surgery, Dean of Naval Medicine and finally Medical Director General (Naval) first encouraged, advised, invited that great medical officer become involved in clinical research. If the Naval Medical Service has acquired a reputation for good clinical research in

* *Indicatively, lectures delivered by the Professor of Naval Medicine at the Royal Naval (Reserve) School and Plymouth on 11 and 17 December 1976 respectively prior to accepting the appointment.*

diet and my own personal diet is for James is unreasonable.

When I was appointed Professor of Naval Medicine in 1975, we were completing a series of experiments at the Royal Naval Hospital, Haslemere as a joint research group with Dr George Isaacowitz and Dr Roy Frier of the Medical Research Council Gastroenterology Unit at the Central Middlesex Hospital, Harefield and his colleagues had defined and described the first H_2 receptor antagonist in Nature in 1973. We had been fortunate enough to obtain supplies of the second generation compound cimetidine, well absorbed when given by mouth, and had been very impressed with its ability to inhibit gastric acid secretion when given at night². Under strictly this drug, powered meals, but certainly became available for limited clinical pharmacological studies early in 1975. In June and July 1975 we were carrying out what were essentially dose ranging studies with cimetidine throughout the day but found periods of near-normal life in healthy volunteers and then in patients with duodenal ulcer disease^{3,4}. On the basis of these results we believed that the dosage of cimetidine should be 200 mg three times daily after meals and 400 mg at night and this was recommended in the medical profession when the drug was put on the market in 1977. Whether this dose regimen is the optimum one is still the subject of discussion.

When I arrived at Haslemere in 1975, it was evident that two factors would greatly influence gastroenterology in the immediate future both in the world at large and in the Navy. The first lay in the continuing development of gastric endoscopy; drugs; the second in the growth of fiberoptic endoscopy of the gastro-intestinal tract as the result of a remarkably technology created in this country but developed in the United States and in Japan. Because duodenal ulcer was a major cause of

morbidity in the Navy, gastroenterology was a branch of medicine in which we could and should play a part⁵. At that time, hyperbaric oxygen therapy was being less used than in its early years and it was possible to use the hyperbaric tank to set up an endoscopy service. This was done by Surgeon Lieutenant-Commander Richard Hunt and Chief Medical Technician Brian Wright who took charge of a new Department of Gastroenterology at Haslemere when it was decided to close the hyperbaric tank for lack of use. Chief Wright later remained in the Department since that time becoming an extremely experienced gastroenterology nurse and endoscopy technician whose loyalty, cheerfulness and capacity for hard work have been invaluable throughout. Surgeon Commander Hunt later returned to the department after completing his higher training at St Mark's Hospital and at the Royal Free and maintaining the sophisticated art of colonoscopy.

With staff and space it was possible to extend the endoscopy service, to introduce special diets for gastrointestinal problems and to turn to further research work in the field of therapy for peptic ulcer disease. It was at this stage that I was approached by the R.N. Command of the Clinical Research Institute, London, King and French Laboratories with the suggestion of co-operative studies on gastric secretion and its modification by drugs. It would like to acknowledge my debt to Mr Richard Jones Mills and others of his staff who have subsequently worked with us on many projects and with whom a very happy association developed and continues. This association did not of course in any way restrict our ability to work on any aspect of gastric secretion or on the drugs available from any other pharmaceutical company and Dr Richard is the first to maintain that no research endeavour is dependent on imperatively. Mrs Diana Vincent joined the

Department in 1977 with a specific responsibility for the research into gastric secretion and was followed later by Mrs Jeanette Kierkegaard on the gastric secretion unit and Mrs Vera Lightfoot and Mrs Judy Miller who were to organize and run a major project on screening for reflux oesophagitis and other diseases. My duty to direct post-graduate research students — intelligent hard working, untried and returning their sense of freedom under the most adverse conditions usually created by their male colleagues — it took that our research programme could not have begun without their help.

Encouraged by a small pilot trial of cimetidine in gastric ulcer¹ we took part in a multi-centre trial of cimetidine in gastric ulcer with Dr Mowbray and Dr Colin Lewis of Queen Alexandra Hospital, Chelsea. Finding no significant difference between it and ranitidine in ulcer healing although the latter drug had considerably more side effects². At the same time we continued our clinical pharmacology studies assessing the effect of adding cimetidine to treatment over twenty four hour periods of therapy in duodenal ulcer patients. At the dose of 400 mg we used no additive or potentiating effects were seen when it was given with ranitidine³. The reduction in gastric acid secretion observed in patients on cimetidine raised the possibility that antacids might correct gastric acid secretion and we examined this further with Dr Paul Shepper, concluding that although H₂ receptor antagonists reduced gastric acid output this was a volume effect more symptomatic was unaltered and that this was very unlikely to produce long term haemological problems⁴.

In 1978 we were able to study a different aspect of gastric acid secretion with the development of Impromidine (ICI 55838) the first highly specific agonist for H₂ receptors which appeared sufficiently selective in animals to justify phar-

maceutical studies in man. Using normal volunteers, of whom the investigators were the first, we carried out dose ranging studies comparing with histamine and promagnum by various routes of administration and dose response curves, with and without a background infusion of an H₂ receptor antagonist (cimetidine)⁵. These studies allowed us to use Impromidine as a precise tool in the evaluation of new histamine H₂ receptor antagonists as they were developed.

Which solvent had control on the possibility of an H₂ receptor antagonist with a longer duration of action than cimetidine, which had come onto the market in the United Kingdom in 1977 and had been shown to be remarkably successful in healing duodenal ulcers in a large number of controlled clinical trials in many countries⁶. Animal work suggested that both cimetidine (Smith, Kline & French) and ranitidine (Glaxo) might be longer acting and both were undoubtedly more potent than cimetidine. With Dr Richard Isaac Mills and three colleagues we carried out an extensive evaluation of cimetidine in 1979/1980 using a variety of techniques to show that its potency although greater than ranitidine varied with the route of administration and that it was an effective drug for the inhibition of gastric acid secretion over a twenty four hour period of normal life^{7,8}. With Dr Robert Walsh and Dr Johnson, and with the support of Allendey Glaxo, we were able to turn our attention to another histamine H₂ receptor antagonist, metidazole. A long daily dose of ranitidine proved to be a more effective inhibitor of gastric acid secretion over the twenty four hour period than cimetidine in standard dosages when given to duodenal ulcer patients⁹ but although more potent than cimetidine in our experimental models we found no evidence that it was longer acting¹⁰.

The popularity and demonstrated

efficacy of high dose nitroglycerin therapy in the United States encouraged us to use the newly low dose technique in a study in which we measured the effect of 250 mg of a magnesium - aluminium hydroxide mixture seven times daily on myocardial acidity in clinical ulcer patients and to compare this regimen with cimetidine. This work was supported by Dr George Pace of Wyeth Laboratories. We were able to show that high dose nitroglycerin reduced intragastric hydrogen ion activity to a similar degree as cimetidine by day, but the effect was significantly less at night.⁷

During this period of activity in the field of clinical pharmacology we were also conducting a double blind controlled clinical trial comparing cimetidine with ranitidine in the treatment of acute duodenal ulcers, conducted with Dr Muschler and Dr Colin Jones. This very necessary trial included 125 patients but showed no significant difference between the two drugs.⁸

I have to, in the brief review of the work of the Gastroenterology Department at Bristol, mention all that has been and is being done even in the field of gastric secretion. New drugs are being evaluated, hypotheses tested and perhaps most important of all we are examining the theoretical concepts that underwriting drugs may be reducing intragastric hydrogen ion activity, increasing the formation of B vitamin compounds in the gastric juice. Research into compounds in this group are given a consequent, the idea has been the subject of much structural and highly sophisticated research in both the synthetic and the biological. Much carefully planned structural and existing experimental work must be done before any serious evaluation of this hypothesis can be made. In the meantime there is no evidence to justify any change in the way these drugs are used by responsible doctors in the management of gastric ulcer

disease. I have not had time to refer to Richard Martin's particular interest in the identification of and the significance of nocturnal bleeding and the use of colonoscopy at this point in our therapeutic programme.⁹ This very important work must await the time when he can describe it in his own time. I had time to do justice to the help we have received from Surgeon-Commander Martin Mashed and Dr Alan Winton in the Department of Nuclear Medicine and from the Departments of Pathology and Radiology.

What therefore has been done from the research effort that I have described? Firstly, I believe the patient with duodenal ulcer disease has benefited greatly from the advances in therapy during the last five years, to which we have made some small contributions. It was necessary to treat patients with duodenal ulcers by long periods of bed rest, dietary restrictions and such like. Recurrent attacks led inevitably to surgery, or to twisting from the current line if it is possible to treat these first in-out patients keeping them at work and alive at 100.

It is evident that not only has the patient benefited the Royal Navy has. The extent to which this is to extend is uncertain, for it is not possible to produce statistics of time spent in hospital, still less to measure the degree of loss of efficiency produced by symptoms endured by those who remain at work. Some data are available on the in-patient time resulting from duodenal ulcer disease since 1950. PM214 are raised on all patients referred to sick quarters and hospitals. Dr Ann Hills and Dr Roger Petherbridge have supplied me with the numbers of days lost in the Royal Navy and Royal Marines due to duodenal ulcer disease from 1972 to 1978 (Table 1). Data for 1979 and 1980 being not yet available. These figures show a remarkable fall in recent years from the time when a medical or was undergoing extensive chemical education

Table 1. The average percentage of the total cost of training medical officers in the Royal Canadian Air Force, 1970-1979.

Year	Percentage
1970	100
1971	100
1972	100
1973	100
1974	100
1975	100
1976	100
1977	100
1978	100
1979	100

(1976) and was generally available (1977). I cannot say that this is cause and effect, but the fall in costs has to be seen as a dramatic one. Nor is it possible to assess what this cost has meant especially in financial terms, for who can express the cost of covering an operational day or tomorrow to land a unit man? To estimate the savings effected for the Fleet by changes in management of medical shore courses is pure guesswork, but they cannot be less than one million pounds per annum during a period when our figures suggest that the incidence of medical shore is unchanged. Similarly, I cannot begin to assess the contribution which the research done in the Royal Navy by my friends and colleagues has made to the service, but I have no doubt that it is a significant one.

Finally a research programme trains medical officers in training. Some wisdom, research experience, some regard is with unqualified civilians. But doctors, many leave how research is conducted before they can work to the work of others, and the Royal Colleges and the Armed Services Committee Advisory Boards expect candidates to have research experience. For the purposes of this lecture I began to list these medical officers in training who had contributed to the work of the department during the last five years and who, I hope, had learned there something of value as a part of their training. The list because far too long, and I hope they will forgive me if I do not mention them all by name. But I am proud of their list.

It is to them now in training and to those early fledgling consultants, and general practitioners that the future belongs. They do not need to be motivated that we have had difficult times and are still going through an acute shortage of manpower and money. Besides I am an optimist. I see that not as something to be defeated as but as a challenge. There are difficult times ahead, but the opportunities that I see in all the hard medical disciplines are so great, so much more varied and so much more unusual than are available outside. With these opportunities we are aiming for excellence and must never be deterred from this goal by difficulties, to achieve it there is much work to be done of the most exciting and challenging sort. There is no place in our service for the faint hearted, nor for those who put away and money above professional satisfaction and excellence. As I lay down my charge I can see with increasing certainty and clarity how much there is to do and how many challenges we must meet if we are to carry out our task to save the sick and return them to the Fleet to maintain their health, support their morale and care for their families. So it is again the Navy, under the good providence of God, that the words, values and strength of the Kingdon do clearly depend.

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The Prevention and Treatment of Alcoholism in the Royal Navy — 1. Identification F. M. P. Miles

Introduction

In Part 1 of this series it was noted that the essence of current Naval alcohol policy lay in the primacy of early intervention.¹ It is vital, in learning from the experience of our civilian colleagues, that we do not forget that the special circumstances of the Service afford opportunities for intervention which may not occur in a civilian setting. These opportunities should not be missed.

Because the drug alcohol is used by most people (often predominantly in a manner acceptable to their self-imposed personal attitude) to derive alcohol not tend to have an immediate impact which may inhibit objective evaluation even by the professional. It should be noted that although educational means may influence moral and psychological disability due to excessive drinking, it can be assumed that physical disability remains independent of such influence. (This is supported by the work of Plant on alcohol-related disability in various occupational groups.²)

Attempts to apply a medical model to the study of alcoholism have resulted in a gross deal of debate, and the whole field of alcoholology (the study of alcohol related disability)/alcoholism is in a state of flux. It has been recommended that the traditional genetic cause/alcoholism be replaced by a more appropriate and less emotive term alcohol dependence syndrome.³ This paper aims to provide a practical guide to early intervention in alcohol related disability in a Service setting. Definitions

of abnormality and abnormal mean has therefore been kept to a minimum. For this reason the word alcoholism has been retained. It is necessary however to present a working description of the condition under consideration.

Nature of the Condition

In the past the term alcoholism was used to denote the occurrence of excessive drinking and consequent damage. The recognition that those who suffered such damage had been drinking in a Service context for some period prior to the onset of damage, and that the nature of identifiable damage was dependent upon variable external factors has led to a re-evaluation of the whole concept. It is now more widely accepted that it is the individual's relationship with alcohol which constitutes the core disability, not the consequences of the relationship.

In terms of the medical model our understanding of alcoholism centres in the syndrome first defined alcohol dependence syndrome³ (the conditions relating only need to be as it is suggested that a number of symptoms and signs cluster with sufficient frequency to constitute a distinct entity — sociology and psychology being unclear).

For most can be learned about alcoholism from alcoholics than from the literature, but for those who have not had the opportunity to talk to a wide range of alcoholics the following working description may be helpful.

Alcoholism is a condition characterized by diminished ability to respond to internal and/or external cues to limit alcohol intake and subsequent internal or periodic excessive drinking which usually becomes socially disruptive. The condition has a tendency towards progression and characterizes the consumption of alcohol as having a positive or increasing importance in the life of the individual often in the presence of other activities. Owing to the core symptoms of diminished control over alcohol intake the alcoholic tends to continue drinking in the face of alcohol related problems and, in order to reduce the resultant discomfort may deny the causal relationship between drinking and problems. As the condition progresses profound physiological changes (eg, withdrawal phenomena) and late phase of damage supervene.

Associated with the core symptoms (diminished control) are a number of secondary symptoms and signs which can be of assistance in diagnosis.

Identification

Early identification is necessary prior to early intervention in predominantly a matter for social management. The medical officer's role is in advising management agencies the management of individuals referred by management the identification of those who present with physical damage and the provision of appropriate treatment.

Identification is frequently a matter of searching down from a number of sources in order to build up a picture of the individual's relationship with alcohol. The primary care medical officers need not however be concerned with the specifics of diagnosis.

The quantity and validity of information obtained directly from the alcoholic depends largely on the manner in which the interview is conducted. During the early

phases of the alcoholic condition clear alcohol related problems tend to be minimal but as the condition progresses and problems about the heavy-drinking mechanisms (intoxication and alcohol) become more pronounced it is essential to recognize that these mechanisms are intrinsic components of the condition and although heavy taking may be difficult the medical officer should try to avoid a hostile or judgemental attitude which would block communication. Direct questions which reveal specific information should be employed for example: "When you go on a run where how much do you usually drink?" — "Have there been times when you drink more than that?" If answers are vague the question should be re-phrased or related to a specific drinking occasion. Direct reference to alcoholism is inappropriate in the initial interview as this only serves to increase anxiety and defensiveness. It is best to refer only to what has emerged in the interview, eg that drinking has resulted in certain problems.

Assessment of the alcoholic should aim to answer the following questions: (1) Are there factors in the history which might suggest a predisposition to alcohol? (2) Is there evidence of alcohol related problems in the history? (3) What is the nature of recent and past drinking? (4) What are the short term effects of drinking? (5) What have been the long term consequences of drinking? (6) Does the client's examination reveal evidence of possible alcohol related damage? (7) Do laboratory investigations indicate possible alcohol related damage? (8) Is further information required? These areas of enquiry will now be considered in turn.

(1) *Predisposing factors* Factors which may predispose to excessive drinking include a family history of alcoholism, impaired relationships with parent or the same sex adolescent, anxiety and emotional

there are psychiatric illness. These factors are in no way essential elements in the diagnosis but when present help to complete the clinical picture.

(1) The history. Medical records may show a history of possible or definite alcohol abuse. Inpatient examinations arising from drunkenness or reports of drinking prior to surgery are self-explanatory but other symptoms and signs may have been recorded without mention of alcohol. These factors which should arouse suspicion are listed in Table I.

Sign	Associated with alcoholism	Signs not associated with alcoholism
1. Tremor	1. Tremor of the hands	1. Tremor of the head
2. Nausea	2. Nausea after drinking	2. Nausea after eating
3. Vomiting	3. Vomiting after drinking	3. Vomiting after eating
4. Diarrhea	4. Diarrhea after drinking	4. Diarrhea after eating
5. Headache	5. Headache after drinking	5. Headache after eating
6. Fatigue	6. Fatigue after drinking	6. Fatigue after eating
7. Irritability	7. Irritability after drinking	7. Irritability after eating
8. Depression	8. Depression after drinking	8. Depression after eating
9. Anxiety	9. Anxiety after drinking	9. Anxiety after eating
10. Insomnia	10. Insomnia after drinking	10. Insomnia after eating

Particular attention should be paid to a history of frequent attendance at the sick bay with minor complaints and to frequent sick on shore calls, especially on Mondays or following leave. Service documents may reveal a history of alcohol-related disciplinary offences, poor or variable efficiency or comments about drinking abuse. Relevant evidence which might be noted by Naval management is summarized in Table II.

Table II. **CLINICAL FINDINGS** (continued from page 14)

Findings	Associated with alcoholism	Findings not associated with alcoholism
1. Tremor	1. Tremor of the hands	1. Tremor of the head
2. Nausea	2. Nausea after drinking	2. Nausea after eating
3. Vomiting	3. Vomiting after drinking	3. Vomiting after eating
4. Diarrhea	4. Diarrhea after drinking	4. Diarrhea after eating
5. Headache	5. Headache after drinking	5. Headache after eating
6. Fatigue	6. Fatigue after drinking	6. Fatigue after eating
7. Irritability	7. Irritability after drinking	7. Irritability after eating
8. Depression	8. Depression after drinking	8. Depression after eating
9. Anxiety	9. Anxiety after drinking	9. Anxiety after eating
10. Insomnia	10. Insomnia after drinking	10. Insomnia after eating

The history obtained at interview can provide evidence of past alcohol-related problems or excessive drinking not previously recorded and careful enquiry may confirm alcohol relationships in non-previous instances of disciplinary treatment.

(2) Drinking pattern. The elucidation of the pattern of drinking behaviour is a vital part of the assessment. It is not sufficient merely to ask "How much do you drink?" Enquiry should refer to situations in which alcohol is consumed, the amounts consumed on different occasions, the frequency of drinking etc. A summary of abnormal drinking behaviour occurring in alcoholism is given in Table III.

Sign	Associated with alcoholism	Signs not associated with alcoholism
1. Tremor	1. Tremor of the hands	1. Tremor of the head
2. Nausea	2. Nausea after drinking	2. Nausea after eating
3. Vomiting	3. Vomiting after drinking	3. Vomiting after eating
4. Diarrhea	4. Diarrhea after drinking	4. Diarrhea after eating
5. Headache	5. Headache after drinking	5. Headache after eating
6. Fatigue	6. Fatigue after drinking	6. Fatigue after eating
7. Irritability	7. Irritability after drinking	7. Irritability after eating
8. Depression	8. Depression after drinking	8. Depression after eating
9. Anxiety	9. Anxiety after drinking	9. Anxiety after eating
10. Insomnia	10. Insomnia after drinking	10. Insomnia after eating

"One does not agree with a person who is not a person. One does not agree with a person who is not a person. One does not agree with a person who is not a person."

(3) Short-term effects of drinking. Evidence of regular consumption together with drinking will suggest that a special relationship has developed between the individual and the drug alcohol to the extent that drinking continues despite the consequences. The well-known hangover and gastro-intestinal symptoms are included in Table I. The alcoholic blackout — inability to recall clearly events which occurred during a drinking bout — would alarm most people but may be experienced repeatedly by the alcoholic without complaint. In addition the regular excessive drinker may commit civil and naval offences and not be deterred by punishment.

(4) *Long term effects:* As the alcoholic condition progresses and the alcohol relationship moves to abuse considerations drinking may cease to be a pleasure and become a necessary ritual which the alcoholic often demands. Often there is a growing sense of uneasiness on waking which persists until the first alcohol can be obtained. In some alcoholics withdrawal symptoms emerge from mild nausea and weak muscular functioning to shivering, sweating and pain. Tremor, visual disturbance may be required before the first drink can be retained. Cravings or in some cases reflexes of drinking may precipitate the major withdrawal syndrome delirium tremens. Depression and suicidal ideas may occur and inflammatory hepatitis may not uncommonly. Social isolation and rigidity may contribute to paranoid ideas and a formerly happy marriage may be destroyed by an acute jealousy.

At home responsibilities are neglected and taken over by the partner. Sexual relations often cease and marital disharmony may lead to separation and divorce. The alcoholism of the alcoholic also exhibits signs of stress in the form of paranoid symptoms, conduct disorders or minor ailments.

Deep feelings of worthlessness, despair and low self esteem are frequently displayed in a display of grandiosity. Although many alcoholics make exaggerated claims about efficiency at work some are indeed highly valued, possibly because with a deteriorating home situation they are pre-occupied to spend long hours in their work areas in the home bar.

(5) *Chronic remission:* In the early stages of alcoholism many physical abnormalities are unlikely to be present in the alcoholism progresses however a number of disorders may occur (Table IV).

(7) *Laboratory investigations:* There is no single test of particular value in supporting a diagnosis of alcoholism. Blood alcohol, mean corpuscular volume and serum gamma globulin immunoglobulin level. The significance of a blood alcohol level has to be interpreted according to the time of sampling but in general the presence of alcohol in a routine laboratory examination should arouse suspicion. Elevation of the first two parameters would support a diagnosis.

(8) *Further explanation:* In case of doubt an attempt should be made to clarify the matter by seeking further information. Possible sources include the Domestic Office, Home Resident groups, friends or colleagues. Physically extreme test is required and medical confidentiality should be protected but vital information can be gained from verbal communication which might not appear in writing.

Interventions

Intervention refers to the action to be taken following identification. In cases of established or suspected alcoholism the means referred to the nearest psychiatrist about the circumstances prior to formal admission.

Coming to the identification and denial that an inebriate accompanying alcoholism there may be considerable resistance to intervention. There is little point in carrying a prolonged discussion of this issue if there is adequate evidence for a tentative diagnosis of alcoholism, intervention is necessary and must be carried out if the worst consequences of this condition are to be avoided.

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MEDICAL APPLICATIONS OF TEXTILES CONFERENCE AT LEEDS UNIVERSITY

Medical Applications of Textiles is the subject of a major conference to be held at Leeds University, 7-9 July 1981, and organized by the Department of Textile Industries. It is many years since a conference was devoted specifically to the subject, and a broad coverage is planned with papers on recent changes, recent patent literature, fibre developments, man-made products, textiles in hospitals, and standards. The conference is intended to attract delegates from the medical and paramedical fields as well as representatives of the textile industry. An exhibition of medical textiles will take place during the conference.

Those requiring further information on either the conference or the exhibition should contact Mr E. T. Green, Special Courses Division, University of Leeds, Leeds LS2, 9JT.

The Through Deck Hospital

R. J. W. Johnson, E. Powell, S. Q. M. Tipler and J. A. Riggall

Introduction

The first of three Invincible Class aircraft carriers, HMS *Invincible* commissioned on March 19 1980. She is the first large ship to be built for the Royal Navy in over 25 years and is the only ship that has been both launched by Her Majesty the Queen and commissioned in her presence.

Built by Vickers Shipbuilding Group at Barrow in Pembrokeshire, the ship was originally designed to operate Sea King helicopters and the P ships Sea King was only incorporated in her design after the ship was launched. The first take off by a Sea Harrier being the sole jump take place on October 30 1980 and a landmark in Fleet Air Arm history.

HMS *Invincible* is 205 metres overall and 162 m at the water line. Her flight deck is 163 m long and 31 m wide. The ship has

a draught of 8 m with a displacement of 18 000 tonnes.

The *Invincible* Class has three major roles:

- 1 To deploy and recover helicopters and V/STOL aircraft in support of task forces at sea.
- 2 To provide anti defence for herself and other forces.
- 3 To provide a platform and facilities for the command and control of maritime forces.

In practice she can undertake joint surveillance and disaster relief operations in support.

To accomplish this she is equipped with one Sea King anti-submarine helicopter, two Sea Harrier V/STOL fighters and the Sea Dart missile system. A range of modern sensors supplies information to the computer driven command control and information system which is also linked by modern communications including a satellite terminal.

Powered by four Rolls Royce Olympus gas turbine engines two per shaft she has a maximum speed of 26 knots and a range of over 5 000 miles at 18 knots. Her engine reduction gearboxes are the largest and heaviest in any ship built.

The ship's company numbers just under 1 000 when equipped for embarkation. Officers are accommodated in single cabins and between 12 and 25 ratings are accommodated in each mess deck. The



Fig 1 HMS *Invincible* is taking on a new air wing at sea during deployment. Below the main mast, the British Royal Air Force Sea King is seen.

turnover throughout the day is modern in style with easily cleaned surfaces, and spacious and living spaces are fully air conditioned.

Medical Department

The Medical Department complements the efficiency of the rest of the ship in keeping the ship's company in good health. It also provides medical support to ships in company and plays its part in disaster relief operations. To fulfil these functions there is a modern well designed sick bay, medical a central hospital.

From the overall plan of the sick bay (Fig. 2) the layout is clear. In 3F section a small entrance lobby on the port side of the ship leads into a waiting area with bed up seating for four patients, which can also be used for lectures and training. The two remaining rooms, general office and dispensary, open from this lobby, as do the two wards and operating theatre. All are well appointed with the usual facilities.

The main ward has four pairs of fixed bunks, the upper one of each pair can be folded away and the lower one modified for use as sitting accommodation. There are two hanging "couch" sets providing access to the patient from all sides. The bunks have individual lights and headphones for SBE programmes and the lower bunks also have electric outlets for blankets. The two WCs and bathroom open off the main ward and there is a small pantry which serves meals and hot drinks, medical meals being provided from the main galley. The shower room doubles as a dark room for developing X-ray films on the Todd TR 80/20. This machine gives excellent results in compact and easy to handle being allowed opposite the pantry entrance.

As well as the main entrance in the sick bay on the port side, there is a small doorway to the forward bulkhead. A double door opens into the starboard passage from the main ward but is normally obstructed by the crash cot. A large removable panel lies between



Fig. 2. SICK BAY COMPLEX, H.M.S. ASHMORE.

the casualty reception and resuscitation area and the main ward. Patients brought from the magazines, hospital flights deck by the weapon lift arrive in the casualty reception area and can then be treated and admitted direct to a new straight table theatre or alternatively if large numbers are involved, initial first-aid resuscitation area desks where can be used as overflow wards.

The theatre (fig 3) has a centrally placed operating table with a fixed overhead trolley for operating theatre light. On the starboard bulkhead there is a double scrub up unit. In a small alcove behind the other bulkhead of the theatre there is a Theatre patient head structure and a small sink for cleaning instruments with racks for storage of sterile drapes. A 4-litre/minister downward displacement ventilator is placed opposite.

It is possible to wheel patients in a trolley to any part of the sick bay. The lower scrub bed would be used for post-operative care in cases if possible from all sides, making the lower roomed out space in the main ward.

The special ward contains a part of deeply covered bunkers, a shower WC and a patient rest unit. This ward can be used for holding patients or functions as a general treatment room. It is mainly used as this latter role since it seems highly desirable to maintain the theatre for purely operative procedures rather than at its intended role of operating theatre/treatment room.

There are three medical stores and several first aid points throughout the ship. The emergency operating theatre (fig 4) is situated in 3A service in the main mess and is one of the most interesting features of the Medical Department. It is hidden behind first aid first-aid panel and when in use, these are moved as a room which normally houses the portable operating table. The area is marked out by a metal surround which can be removed together with the overhead canopy. A partitioning screen can be rigged from overhead rails. With the canopy



Fig 3. Operating theatre within the Sick Bay. An alternative operating position is in the main background.



Fig 4. Emergency operating theatre in 3A service.

removed, the theatre table legs are fixed into deck sockets. Above the table is an operating theatre light assembly connected behind a panel in the starboard of the room behind the panel has adequate space for ready use theatre equipment, drugs, dressings, resuscitator, O₂ inhaler and a small washbasin supplied with hot and cold water and an emergency hot water supply.

The flight deck sick bay (150) has the casualty reception ward, contains a fixed table for the primary treatment of casualties. This table takes up valuable space and does not sit continuously thus access to the head end is poor. A similar table in the casualty reception area will be replaced by a modern operating theatre

alley and that in the flight deck sick bay will be removed and replaced by a conventional examination couch. The flight deck sick bay is provided with a standard workbench, cupboards and drawers for the storage of medical stores.

Dental Department

The Dental Department, staffed by a dental surgeon and one PMMA, is situated on the deck near the sick bay. It comprises a waiting room, laboratory and surgery (Fig 3). The department is generally well designed and beautifully finished. The waiting room seats three patients and contains a cupboard for cleaning gear, jacket storage, and a filing cabinet. The laboratory provides ample storage space and contains equipment for the manufacture of acrylic dentures, plaster models and repairs in various forms of ship's equipment.

The surgery has two ample storage spaces facing both deck and bulkhead mounted cupboards. The dental unit is the Airtec Air-Bayette remote unit, although it is a little too close to the cupboards. (When a short left handed beggarman was working on board, it was discovered that a short left handed dentist would have problems, particularly if he wanted to use an aspirator during treatment.) The electrical power (240 volts) is supplied through a main supply fitted in the department and passengers are taken from the ship's LP supply. In some months running there have been no black-outages.

Overall the department is pleasing to work in and easy to maintain. It is well ventilated and usually comfortably cool. The designers and builders have produced a well laid out functional Dental Department.



Fig 3. Dental department.

Conclusion

BM2, *Admiral's Flagship*, with its sophisticated ventilation equipment and weapon systems is an excellent design concept and a prestigious new ship for the Royal Navy. The Medical and Dental Departments are well designed functional pleasant-to-work-in and very able complements the side of the ship. The main criticism of the sick bay does not detract from the excellent impression held by those who work in the department and by the 26 naval medical officers, who have visited to date.

Acknowledgements

The assistance of Lieutenant Commander H. F. Luxford in the preparation of this article is gratefully acknowledged.

Massive Congenital Pelvic Arteriovenous Fistula

R. A. Katten and F. B. Wilkes

ABSTRACT

Pelvic arteriovenous fistulas congenital in origin are rare. The management of such problems are complex and new approaches are being sought to improve results of such operations and minimize the frequency of recurrence. A report of a patient with a massive congenital pelvic arteriovenous fistula emphasizing the unusual clinical presentation and approach to therapeutic considerations.

Introduction

The existence of congenital pelvic arteriovenous fistula is difficult to document, but it is to be assumed that it is a relatively uncommon disease as evidenced by the few reports of such lesions in the literature. Massive congenital pelvic arteriovenous fistula is extremely rare.¹ Traumatic fistulas are relatively more prevalent secondary during military operations, warfare, dog bites, and following surgical manipulation.² Penetrating injuries such as rifle wounds or shrapnel resulting in major vessels during removal of an unexploded device would account for many of the arteriovenous fistulas within the abdomen and pelvis.

While traumatic cases present early congenital arteriovenous fistulas rarely produce directly cardiovascular problems and tend to be well tolerated after coming to clinical attention later in the second and third decades. A case of massive pelvic arteriovenous fistula presenting as a femoral aneurysm is reported and attempts at management using therapeutic embolization are discussed.

Clinical Report

In late 1976 a 34 year old soldier presented with a two year history of pain on sexual arousal which radiated down his thighs to the right leg and down torso, and lasted up to 90 minutes following ejaculation. Partial relief was obtained by pressing on the right lower abdomen. Earlier orthopedic investigation while stationed there had failed to elucidate the cause of his early problems.

Rectal examination revealed a pulsatile mass on the right associated with a systolic murmur in the right iliac fossa. Intravenous urography and cystoscopy demonstrated an extensive mass indenting the bladder wall. Radiologically the mass shadow was at the upper limit of normal and arteriography showed a large arteriovenous fistula fed by enlarged external iliac artery, inferior vena cava, and median sacral arteries with rapid opacification of the inferior vena cava (Fig. 1). On abdominal examination the mass measured 5 cm in depth and 6 cm in its transverse diameter. Cardiac output normal using a thermocoding catheter in the pulmonary artery was the right subclavian vein was 15 liters per minute.

The pelvis, size and number of feeding vessels combined to make surgery very dangerous to embolization was performed. Initially doublet catheter was inserted through an end hole side port percutaneous introduced into the left iliac artery and manipulated into both external iliac arteries. Following the procedure the



Fig. 1

cardiac output fell to 15 litres per minute and there was threatened of the left cerebral distal artery. An occlude was placed that 40% of the cardiac output was passing through the lesion.

Three months later the patient underwent further embolization when attempts were made at the right cerebral distal artery which resulted in a reduction of cardiac output to 10.7 litres per minute. Consequently the patient experienced difficulty in obtaining an erection and declined further treatment for a six month period. At this point he was evacuated from the Army.

On return to service in early 1975 he had increased dyspareunia. His cardiac output had increased to 18 litres per minute. He had further embolization procedures. During 1977 despite this his cardiac output remained markedly depressed and he still required good penicillin.

His more severe angiography in May 1980 showed both cerebral distal arteries to be occluded but the inferior mesenteric artery had greatly increased in size. This was embolized with a mixture of lyticase and

gel foam. The patient experienced severe abdominal pain post-embolization which settled spontaneously though subsequently he passed a blood clot indicating that the embolization had caused large vessel occlusion. He had not experienced any occlusion of his lower limbs. His distal X ray continued to show marked decompression of the right cardiac output. He continues under review in the care of Professor G. W. Taylor at St Bartholomew's Hospital, London.

Discussion

This case demonstrates several interesting features. The issue of the severe pain on removal of a vessel is a rare phenomenon and its exact cause is unclear. It may arise from substance P-induced spasm, or venous congestion. These features described the classical clinical findings of an arteriovenous fistula in 1957. The problem has inspired surgeons. There is also clinical and physiological evidence² that major arterio-venous fistulae will proceed to cause distal lower limb ischaemia. Histologically there appears to be marked arteriolelethiasis of the vein and dilation and tortuosity of the proximal arteries.³ It has been demonstrated that prompt closure will arrest the development of such complications. Clearly it follows therefore to attempt closure as soon as the diagnosis is made.

Many of the successful closures have been in the traumatic group achieved during wartime experience: quiplicate ligatures and a device being developed in the Second World War and another reconstruction in the Korean War.⁴ However such procedures may not be safe or advisable and other techniques have been developed. Recently therapeutic embolization has been used successfully in small distal lesions and in aneurysmal lesions.⁵ Successful reports on the larger traumatic variety also exist,⁶ but very few reports⁷ of successful embolization of massive pelvic

artificial nose filter can be found. This statement therefore remains experimental.

Surgical management in this case would be a difficult and dangerous procedure possibly jeopardising the vascularity of the lower limb and testis. It was hoped that the less invasive technique of embolisation would be successful but it failed on two counts. Firstly there appears to be revascularisation of the embolised vessel and secondly even if Gamble's does occur collateral vessels seem to replace them not to destroy them.

Clearly the large congenital arteriovenous fistula remains a problem and neither surgery nor embolisation appear to be the answer. Possibly a combination of both approaches may lead to better results.

Acknowledgements

The authors would like to acknowledge the help of Professor G. W. Taylor MSc FRCS in Barts Hospital in the

assessment and management of this patient.

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Out-patient Treatment of Haemorrhoids

R. J. Roberts

ABSTRACT

The aims of the present treatment of 447 patients with H° (I to II) were the relief of pain, the relief of H° by rubber band ligation (the treatment) with successful sclerotherapy was given within the median 14 hospital admissions for out-patient treatment.

In May 1979, Royal Clinic was established in the Royal Naval Hospital, Devon, primarily for the treatment of haemorrhoids but also to allow a rapid return of patients to the ship, if necessary, after treatment of the disease. During a five year period over 100 patients have been referred for treatment of haemorrhoids by which 447 have completed their course of therapy. A retrospective survey of these patients with haemorrhoids referred to a rubber band ligation in the previous year (1978) shows the comparison that the patients have required operation after the time treatment.

Our patient treatment has been found to give a delay rate of complete relief and resulted in a much shorter time away from work without the considerable cost of hospitalization. It is therefore recommended that such treatment should be available to naval shipyard personnel.

Patients and Methods

Patient

Thirty-two patients with H° (I to II) presenting at the clinic, Royal Naval Hospital, May 1980 were studied and it was found that 44 admissions for out-patient treatment during the period May 1979 to May 1979. The age range of the patients was 19-60 (mean 41.5) and 19-66 (mean 46) respectively (Fig. 1) the ratio of male to female being 3.5:1 in both groups.

Methods

Out-patient treatment consisted of conventional sclerotherapy as described by Blackford¹ treatment in the case of large first degree or second and third degree haemorrhoids with rubber band ligation. A

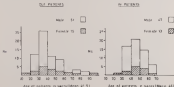


Fig. 1

maximum of two were banded at any one time instant.

Operative treatment was in the form of a standard Malignant and Malignant haemorrhoidectomy² or manual dilatation and in some cases dilatation together with rubber band ligation.

The length of leave ranged from one month in 30 patients (mean 5.7 yrs) in the out-patient group, and three months in 30 patients (mean 9.8 yrs) in the in-patient group. The most predominant symptom in both groups was bleeding (Table 1) and more patients had received some form of treatment previously: the most common being suppositories (Table 2).

As would be expected, there were more patients with first degree haemorrhoids in the out-patient group, but a similar number of several degree lesions in both groups (Table 3).

Thirty six patients received outpatient rubber banding alone and 30 a combination of outpatient and rubber band ligation. In the previous year 65 operations were performed on the 68 in-patients. 27 underwent haemorrhoidectomy alone and dilatation alone and 31 anal dilatation plus rubber band ligation.

Results

The mean duration of hospitalization in the in-patient group was 8.5 (s.d. 9 days) and total time off work 32.9 (s.d. 15 days). Considering each out-patient attendance as one full day off work, the out-patient group spent from one to three days away (mean 1.4); the length of time under one patient care being one to three months (mean 2.3).

The results of treatment were graded as: Symptoms have improved. No change. Worse, compared with their pre-treatment state (Table 4). The number of patients obtaining complete relief of symptoms was significantly greater in the out-patient group ($\chi^2 6.0^3 = 3.43$, $P = 0.06$ than 0.05).

TABLE 1 Symptoms

	Out-patient Group		
	In-patient Group		
Number	36	30	
Frequency	100%	100%	
Sex M	2	1	100%
Sex F	34	29	100%

TABLE 2 Previous treatment

	Out-patient Group	In-patient Group
Suppositories	10	100%
Other	26	100%
Sex M	1	100%
Sex F	25	100%

TABLE 3 Degree lesions

	out-patient group		in-patient group
	n	%	
Gender: male	10	27.8	100
Gender: female	26	72.2	0
Marital status	10	27.8	0
Age range (years)	10	27.8	0
Illness	10	27.8	0

TABLE 4 Results of treatment

	Out-patient Group		
	In-patient Group		
Long-term	26	19	100%
Day cases	10	11	100%
Sex M	1	1	100%
Sex F	9	10	100%

Discussion

Haemorrhoids have caused distress and suffering to countless patients for centuries and there is little doubt that the public's view of haemorrhoidectomy is coloured by reports of pain, serious bleeding and misadventures of some pain at the post-operative period. This, together with the increasing costs of hospital attendance and the economic position coupled with the operational difficulties at the time of commencement of prolonged periods away from work, has led

to the development of a variety of outpatient procedures for dealing with the offending deposit. The sides of three-specimen sclerotherapy were not widely practiced in this hospital until May 1979 when, with the re-establishment of a specialized rectal clinic, resurfacing of the outpatient banding and treatment made it readily available. The efficacy of outpatient therapy for first degree haemorrhoids, well recognized² and with the addition of rubber band ligation, most recent and some first degree haemorrhoids can be adequately treated. The results in this series show a larger percentage of patients obtaining complete relief of their symptoms and a marked reduction in the time away from their employment, without the need for hospital admission. An approximate calculation of the savings produced revealed a figure of £11 000 for the Royal Naval Hospital, Haslar or £28 500 for a National Health Service hospital for first and second degree haemorrhoids alone based on figures from the Patient Departments of 1968 Haslar and the City and New London Area Health Authority for 1978/79 (note). However, it is fair that in patient group did have a greater number of patients with third degree haemorrhoids and less with first degree but there were similar numbers with second degree lesions in both groups. The results comparing these patients show similar figures to the whole study with more

more significant symptomatic relief ($P < 0.01$) and less time than 0-ED (Table V).

TABLE V. COMPARISON OF SYMPTOM AND RELIEF IN OUTPATIENT WITH OUTPATIENT AND INPATIENT

	Outpatient series	Inpatient series
No. of patients	15	20
Mean time for treatment	5	5.5
Mean time to 1st ED	1.1	2.7
Healed	10	10
Symptomatic relief	100%	100%
Days off work	10.1	21.2

Conclusion

This study has shown the value of a specialized clinic for the outpatient treatment of haemorrhoids using a combination of specious sclerotherapy and rubber band ligation both in the symptomatic relief obtained by the patients and the economic aspects of treating an extremely common condition. It is therefore recommended that these outpatient techniques should be more widely used.

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A Large Ethmoidal Osteoma

R. T. Cawson

Introduction

Osteomas occurring in the paranasal sinuses are rare, bony tumours. They are slow growing, benign and arise from the inner wall growing into the lumen. The diagnosis of the mass involved is by histology, that which is needed rather than the bare of angle.

Frequency

These tumours are uncommon but the exact frequency is unknown, mainly because a high percentage are asymptomatic and so undiscovered. Radiographic studies show an incidence of 0.1 per cent to 0.4 per cent of patients examined.^{1,2}

In a series of dissections Van Allen (Michigan)³ found

Frontal	36.6%
Ethmoid	23.68%
Maxillary	4.8%
Sphenoid	1.55%

Aetiology

Paranasal osteomas are supposed to arise most commonly in young males after the age of puberty and that is suggested by some to indicate an hormonal aetiology. Goss⁴ comments on the theories on

Frontal — basal injuries are very common.

Ethmoid — probably secondary to osteomas.

Sphenoid — supported by the occurrence in young patients and by

Endocrinological — no publication is shown where endocrine (ethmoid) and maxillary (sphenoid) bones meet.⁵

Pathology

Bony osteomas are variously classified but this will fit with the following scheme:

- 1 **Compact** — with a compact lamellar structure, including both Haversian systems and canaliculi.
- 2 **Compacted** — with a peripheral compact area of bone and cysts.
- 3 **Mixed** — have a peripheral compact zone and a sponge core with elements of both 1 and 2.

Symptoms

The majority of bony osteomas are asymptomatic. Those who develop symptoms have normally had them for several years before seeking treatment.

Ethmoidal osteomas produce symptoms earlier than frontal bones, probably because the space is more restricted.

Pain (usually in the region of the sinus) is the most frequent symptom. The site of the tumour is not related to the extent of pain, the sites of which has been related to pressure, infection and obstruction of the sinus openings. Other symptoms and signs are orbital cellulitis, globe displacement, deformity of the face and forehead sinuses and periorbital dilatations. Extension of an osteoma into the anterior cranial fossa can produce

confronted facial rhinorrhea, meningitis, leucemia, and paraneoplastic lesions.

Clinical History

May 22, 1976. A 36-year-old sister presented to the ENT Department, Naval Naval Hospital, Boston with increasing nasal swelling on the right side. The swelling was firm and painless.

Past History (see a previous)

1971. — Submaxillary abscess and bilateral nasal sinuses.

1974. — "Waxiness" with pus on the right. Biopsy of nasal tissue for carcinoma.

1976. — Continued mass lesions in the head and developed a tender swelling over the right frontal region. A subperiosteal abscess was drained (2 ml) and the bone appeared healthy. Tomography showed what was called lateral displacement of the lateral nose, ethmoidal and frontal bones on the right, with possible osteoplastic changes.

8-1-76. Recent tomography (Figs. 1 and 2) confirmed the opaque, swelling appearance, occupying the whole right nasal cavity.

The swelling extends posteriorly from the right nasal opening and was covered with normal appearing mucosa. The left nasal cavity was normal except that the septum was pushed over to the left.

The epithelioma specialists felt that there was possibly right eye displacement but the vision was normal. He had some minimal chest abnormalities on the right. A biopsy was taken of bone material which was like normal bone. The fungus showed uniform appearance of wide infiltration of mature lamellar bone. Distal areas were prominent and eosinophilic were present around the periphery of more trabecular lamellar bone or connective tissue was loosely cellular, with occasional fatty areas, and of variable vascularity. No histopathologic elements were seen. The histological appearance was that of a foreign carcinoma. (Fig. 3)



Fig. 1. Tomography showing large swelling, displacement of lateral wall of right frontal sinus, lateral displacement of ethmoidal bone.



Fig. 2. Tomography showing large swelling, displacement of lateral wall of right frontal sinus, lateral displacement of ethmoidal bone.



Fig. 3. Tomography showing large swelling, displacement of lateral wall of right frontal sinus, lateral displacement of ethmoidal bone.

Operation

Bradley *et al*² described an extensive involving multiple parietal masses which they treated through an extended lateral craniotomy approach. This involves removing the whole mass laterally including the capsule thereby exposing the whole posterior aperture.²

In this case a right lateral craniotomy was performed (Fig. 4) and the right parietal bone was rotated on the spreader (Fig. 5).



Fig. 4. Craniotomy (right side) and the removal of the capsule. The capsule was removed and the brain was exposed. The brain was rotated on the spreader (Fig. 5) and the capsule was removed.

The capsule was rotated and the right frontal and parietal lobes were exposed. The right frontal lobe was exposed and the capsule was

removed. The capsule was very thick and removed. All the right hemisphere was exposed from within.

The entire capsule was removed when a large CSF leak was trapped when the capsule had been removed through the arachnoid plate. The leak was plugged with muscle from the brain. The whole cavity was packed with a RFP pack. Six days later the pack was removed and no further CSF leak occurred. One month later the right frontal lobe was slightly elevated but eventually cleared.

The patient has had no recurrence but has had an SMC to strengthen a given rapid deviation.

Summary

It is easy to get extracranial as large as this. There are fairly common but are normally asymptomatic. Surgery is indicated if symptoms arise in association with an asymptomatic condition.

Acknowledgement

The histopathology report for Fig. 3 was kindly supplied by Surgeon Commander D. J. Rhodes RRC.

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Phthiriosis Pubicorum — An Unusual Cause of Itchy Pubes

R. J. B. Wiggins

ABSTRACT

Two cases of *Phthirus pubis* are described. In both pubic ectoparasitosis, as well as the typical pubic itch, associated with the infestation were found and a blood count, skin test and culture.

Clinical Reports

Case 1. The 39 year old soldier, having contracted gonorrhea and pubis, lower abdominal pain located on lower left side with tenderness and low dorsal flexion, his genital and pubic problems cleared up but he was left with a Itchy Pubes which did not respond to G₆ Chloromphenicol.

On examination at the Eye Department he was seen to have an asymmetrical bilateral Itchy Pubes and pubic hair was found clumping in the left axilla (Fig. 1) there were also many nits containing viable one attached to the shafts of the hairs. The hair was killed with 10% kerosene (2%) and these corpses, with the nits were removed with forceps. The Itchy Pubes cleared within two days.

Case 2. The 16 year old private, with a severe dry itchy itchy of ventral Itchy Pubes, inguinal and lower back found on the lower with one fig. 2. There was no evidence of infestation anywhere else on his body, within the absence of any direct contact with her it was assumed that she had contracted the infestation at her previous school.



Fig. 1. Pubic hair with attached nits.

As this was a female (16 years old) was treated for this, with Golden Eye ointment and subsequent hot packing.

Distal pubic infestation is exceedingly rare and a search of the international literature revealed only one case report.¹

Discussion

Of the three commonest parasites on man, surprisingly only *Phthirus pubis* seems to settle on the pubes and then *antraxanthus*.

Phthirus pubis causes intense itching, but is not common on the scalp, but very



Fig. 2. Pubic hair with attached nits.

rarely been reported on the syndrome of lobes.¹ *Pseudomonas aeruginosa* has never been described in this context.² *Phlebotomus* species are most commonly encountered in the context of retinal infection and as aetiological of joint myeloma. It is thought to be transmitted to the eye from elsewhere on the body by the hands.

Infection leads to a low grade lymphocytic and sometimes a macrophagic of the vitreous body, at a probable the focus of infection. But since the local inflammation. Chronic infection may lead to pruritus and excretion of the lids, and the subsequent changes may mirror those of trachoma.

Stenotaphrum secundatum is most common, usually the bright green leaves of this grass. It is found all over the body but particularly in the external auditory meatus. The nose, eyelids, and on the pharynx, it is not described in children. Can by the age of 40 years 90 per cent of children carry the bacteria in their noses and by 25 years *Stenotaphrum* is found almost universally.³ *Stenotaphrum* has been blamed for a variety of diseases including Pterygiae formation and as the aetiology for the production of conjunctivitis of the lids. In children *Stenotaphrum* lymphadenitis, as well as the atrophy of the nose however it is unlikely that *Stenotaphrum* is solely responsible.

Diagnosis: This is made by identifying the louse which is easily done with a simple magnifier by the mirror has well illuminating, longer the louse are seen clinging to the eyelids with a fine drawing of oval (Fig. 2).

Management: The most effective drug is Eserine or one of the other anticholinergics either as drops or ointment. It, producing the action of Acetyl choline as the neurotransmitter paralyse Eserine paralyse the louse and kills it. There is no effect on the eye which are exposed to the eye. Eserine may have even in ophthalmic doses, very unpleasant



Fig. 1. Massive conjunctivitis and corneal involvement.

side effects, induced atropine, purified serum of the vitreous body, if necessary and remaining are all considered as a.

Before use of atropine, Chlorine (Chlorine) is well tolerated and is a primary treatment.⁴ But, as *Stenotaphrum* are extremely sensitive to the louse and the overall nervous system so infection in the continuously, vigorous local infection they now also spread, place to the infected louse. It is not clear whether surgery will be complicated by pruritus in general or by a more severe non-infectious condition of night/day bearing respiratory response, but a short course is usually necessary.

During the louse and removing the lid margins with crystal in a solution which has been described as being curative while 24 hours.⁵ The lids will have been removed with the louse and the remaining white epithelium by the eyelids.

Other anticholinergics such as DDT and formal benzamide are less helpful by the eye to be removed completely as they will cause a violent chemical reaction, conjunctivitis.^{6,7}

Infection with *Pseudomonas aeruginosa* is best treated with Cefazolin on the eyelids and Cefazolin because benzalkonium 2% as a detergent base on two occasions as soon as possible. This is commercially available as Lomoxin or Lomoxin.

Conclusion

Two cases of *Phlebotomus* *Pterodermis* are

described with differential diagnosis and various treatments discussed. In one of the cases, with adequate history the diagnosis could have been made earlier and different treatment advised.

Acknowledgments

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The End of an Era — The Start of Mass Miniature Chest Radiography in the Royal Navy

R. M. Lathbury, *FRCS*

Just over forty years ago the Royal Navy set up the first Mass Miniature Chest X-ray service in the United Kingdom as a weapon in the fight against pulmonary tuberculosis: a system which was ultimately adopted by the other Armed Forces and civilian institutions. The incidence of the disease was particularly high in the Royal Navy at that time and the RN scheme proposed that all Service personnel should have a chest x-ray on entry, approximately annually throughout service and finally on release. The aim was to register later in reducing the incidence of pulmonary tuberculosis in the early days, but the advent of chemotherapy has so altered the situation that while mass radiography remains a justified mode of diagnosis for which it was conceived this aim has been achieved.

In July 1939 following references to the medical literature to a new system of mass miniature photodiagraphy which was being tried out in Africa, Germany and Holland, the RN Medical Service set up a permanent apparatus at the Royal Naval Hospital, Chatham. Results were encouraging but the outbreak of hostilities delayed production of purpose-designed machines. It was not until March 1940 that a photodiagraph machine using a 15mm roll film, designed by Gordon Cox Ltd, was introduced first at RN Hoveville, Chatham, then at HMS Portsmouth, in a way all naval personnel passing through their establishments could do so. The machines produced a high proportion of positive findings and eventually a total of about half units were

deployed at special barracks and new entry establishments, with a mobile unit in deal with the scattered naval air units. At the same time the Army and Royal Air Force set up their own mass radiographic units.

With the end of hostilities and the closure of many subsidiary establishments, RN policy on entry chest x-rays and the timing of apparatus was reviewed. The final policy decision was that which governed the process until recently: on entry on entry usually and on release. X-ray apparatus was still at the three main barracks (Chatham, Portsmouth and Plymouth) HMS Ganges, the large new entry machine unit at Stanley, near Ipswich, HMS Malta, the Naval Base, Singapore, with one mobile unit under the direction of Flag Officer Naval Air Command. Each station unit was attached to a conventional x-ray department with a radiologist on control and the mobile unit which was accompanied by a radiologist on its tour of duty had an additional facility for taking large plain x-ray films of the chest.

In 1946/47 several more x-ray units were re-equipped with 15mm roll film cameras produced by Messrs Philips. However a common identity mark Armed Forces employed units to deal with its own personnel wherever deployed in the UK, thereby resulted in considerable wasteful duplication of effort. Discussion on resources available, the future equipment position and the differences in philosophy between the three Services as to the required frequency of routine chest x-rays resulted in a Tri-

Service agreement in 1963 whereby the UK was devoted one shore station of submarine search facilities undertaking to carry out all short range requirements in one particular area. The RSN was responsible for the whole of Wales and for England south of a line running approximately from the Bristol Channel to the Thames, including the Alderney and Lundy areas but retaining the one based at HMS Ganges. With the reduction in the area to be covered, the decrease in numbers passing through such one RSN Portsmouth had fallen from its normal peak of some 100 000 to about 20 000 for example and the necessity for economy of personnel, the radiological unit remained from the establishment and its immediate processing were read at RNB Portsmouth. Plans from HMS Ganges became the responsibility of the radiologist at RNB Chatham, and those from RNB Devonport were forwarded to the radiologist at RNB Portsmouth.

By 1967 the Naval Medical Department had become concerned about submarine-related chest disease in HM Naval Base civilian personnel, who was up to that time a royal by the civilian means a ray unit in the appropriate areas. At the same time, the Navy was confronted by a demand to control such a mobile unit, a ray facility in 1968 because of the vast accident in the incidence of pulmonary tuberculosis in the UK following the successful introduction of chemical therapeutic treatment. It was therefore decided that there was a continuing commitment to a ray RM civilian personnel and to achieve this the RM mobile unit would have to be extended to 100mm film capacity which was considered more suitable for the early diagnosis of subclinical abnormalities. A 100mm capacity would be provided at RNB Gibraltar to serve locally entered employees who mainly originated in Morocco. However, it was obvious that the requirements for standard chest x-ray was not being met during mobility

by the alterations in naval drafting procedures whereby even no longer had to pass through the main barracks. While the incidence of pulmonary tuberculosis in the RSN had been continuously reduced, those cases which did occur were fatal mainly in those where chest x-rays had been neglected for anything up to five years, and it was decided that the ray personnel must be matched together. The subsequent survey was further aggravated by the fact that films were divided into different categories of film termed personnel and fixed in five separate places, while those of RMOC civilian personnel films were a rapid only on a voluntary basis were filed at the places where they were taken. This made reference difficult and wasted chest effort. Finally, such unit was under different medical control with no central guiding hand.

It was therefore decided to form one largely mobile centre, to be known as the Royal Naval Base Mammography Radiography Service under the purely medical administration of the Medical Officer in Charge of the Division of Naval Medicine. This was to cover the naval commitment under the Tri-Service agreement and would also visit the four Home Naval Bases at Chatham, Portsmouth, Plymouth and Royal Naval Dockyard. The service would comprise two mobile units and the static unit at HMS Nelson formerly RNB Portsmouth, each with a 100mm capacity under the control of a radiologist in charge of a central processing and filing base. Here films taken by all three units would be processed and recorded and any action for taking further large films or other means given would then be arranged. The 100mm unit at HMS Ganges would be retained until such time as that establishment closed (planned for 1970) and the 100mm unit at Chatham was to be closely affiliated to the RMOCSS.

The base was set up in temporary accommodation at HMS Drydock pending completion of the planned rebuild of 1964 and a radiologist appointed as MR24C ENMEMRS. It was thanks to this temporary accommodation at the time of writing in 1966 the original mobile unit was replaced by a new one consisting of two vehicles: the 1st vehicle — a Bedford Van bus chassis and engine with a body built at the RN Major Transport Depot Stanthorpe comprising a large cub to accommodate the case while travelling to destinations, the entry room with separate entrance and exit doors and a small office; and a generator vehicle — a Bedford TK chassis with a body in two compartments: one containing lockers for the case members' effects, the other a Morrison motor alternator and storage space for auxiliary equipment. The unit was operated in 1000m Glen up until 1969. The processing base was partially transported in September 1969 and provided with an OCELOCAMATIC automatic processor, the clinic used at HMS Devon was converted to 1000m Glen, the construction of a second mobile unit slightly modified as it was no longer necessary to provide facilities for processing at Glen was put on hold.

Inevitably there was delay in obtaining the new equipment and the ENMEMRS was not formally reinstated until September 1970. As the second mobile unit did not become available until July 1971, the clinic units at HMS Devon and HMS Pembroke continued until August 1971 when the Service finally reached its planned form. Owing to the geographical distribution of the establishments, to be covered and with the number of naval units varying according to population for example new entry or discharges, required a visit to the part of each branch one unit was based at HMS Devonshire to be deployed over the greater proportion of the year, the other at HMS Devon with a more limited travelling task.

In order to cope with the increasing time between visits, 124 shore patients' needs were involved with in addition numerous visits to out going ships at Chatham Dockyard and Portsmouth and to reduce the manpower making while a typing, the units were manned by a crew of one radiographer and two non medical ratings in addition to the clinical doctor. This gave a maximum working speed of some 300 persons per hour. On many occasions the number served on one day on one site exceeded 600 the highest daily figure being 1 310 when alongside HMS Eagle on May 19 1991 and the record highest 928 at the RN Stores Depot Capenhurst in 1976. In case of the village around 4100 No 3 Unit has covered 250 000 miles in its lifetime the fact that working time was necessarily confined to personnel were not available for a couple of weekends or leave periods and the provider maintenance periods required to keep the units on the road, the average figure of 450 hours a week every working day, all on open air and whatever the weather is a great tribute to the dedication of the staff employed.

Incidentally the Chief Medical Technicians in charge of the No 3 Unit for the first five years of its life as part of the ENMEMRS must hold a record for being the recipient not only of the RN Long Service and Good Conduct Medal but also of the RN Long Service and Good Conduct Medal and five.

In the early war time days of mass radiography considerable time and effort was involved in compiling records from which successful queries could be obtained, but with fragmentation of time and the later Two Service agreement this practice was discontinued and no useful records are available to the author. However, once the advent of the ENMEMRS custom figures do exist although they are not statistically valid, owing to difficulty in obtaining definitive results of further investigation of jobs up among volunteers a good re-

TABLE 1

Year	Reported Deaths	Actual	Actual over Reported	Mid- shipmen	Deaths as percent of Midshipmen	Deaths as percent of All Deaths	Deaths
1971	4,111	4,011	100	2,071	50%	100%	4,011
1972	4,111	4,111	0	2,071	50%	100%	4,111
1973	4,111	4,111	0	2,071	50%	100%	4,111
1974	4,111	4,111	0	2,071	50%	100%	4,111
1975	4,111	4,111	0	2,071	50%	100%	4,111
1976	4,111	4,111	0	2,071	50%	100%	4,111
1977	4,111	4,111	0	2,071	50%	100%	4,111
1978	4,111	4,111	0	2,071	50%	100%	4,111
1979	4,111	4,111	0	2,071	50%	100%	4,111
1980	4,111	4,111	0	2,071	50%	100%	4,111
1981	4,111	4,111	0	2,071	50%	100%	4,111
1982	4,111	4,111	0	2,071	50%	100%	4,111
1983	4,111	4,111	0	2,071	50%	100%	4,111
1984	4,111	4,111	0	2,071	50%	100%	4,111
1985	4,111	4,111	0	2,071	50%	100%	4,111
1986	4,111	4,111	0	2,071	50%	100%	4,111
1987	4,111	4,111	0	2,071	50%	100%	4,111
1988	4,111	4,111	0	2,071	50%	100%	4,111
1989	4,111	4,111	0	2,071	50%	100%	4,111
1990	4,111	4,111	0	2,071	50%	100%	4,111
1991	4,111	4,111	0	2,071	50%	100%	4,111
1992	4,111	4,111	0	2,071	50%	100%	4,111
1993	4,111	4,111	0	2,071	50%	100%	4,111
1994	4,111	4,111	0	2,071	50%	100%	4,111
1995	4,111	4,111	0	2,071	50%	100%	4,111
1996	4,111	4,111	0	2,071	50%	100%	4,111
1997	4,111	4,111	0	2,071	50%	100%	4,111
1998	4,111	4,111	0	2,071	50%	100%	4,111
1999	4,111	4,111	0	2,071	50%	100%	4,111
2000	4,111	4,111	0	2,071	50%	100%	4,111
2001	4,111	4,111	0	2,071	50%	100%	4,111
2002	4,111	4,111	0	2,071	50%	100%	4,111
2003	4,111	4,111	0	2,071	50%	100%	4,111
2004	4,111	4,111	0	2,071	50%	100%	4,111
2005	4,111	4,111	0	2,071	50%	100%	4,111
2006	4,111	4,111	0	2,071	50%	100%	4,111
2007	4,111	4,111	0	2,071	50%	100%	4,111
2008	4,111	4,111	0	2,071	50%	100%	4,111
2009	4,111	4,111	0	2,071	50%	100%	4,111
2010	4,111	4,111	0	2,071	50%	100%	4,111
2011	4,111	4,111	0	2,071	50%	100%	4,111
2012	4,111	4,111	0	2,071	50%	100%	4,111
2013	4,111	4,111	0	2,071	50%	100%	4,111
2014	4,111	4,111	0	2,071	50%	100%	4,111
2015	4,111	4,111	0	2,071	50%	100%	4,111
2016	4,111	4,111	0	2,071	50%	100%	4,111
2017	4,111	4,111	0	2,071	50%	100%	4,111
2018	4,111	4,111	0	2,071	50%	100%	4,111
2019	4,111	4,111	0	2,071	50%	100%	4,111
2020	4,111	4,111	0	2,071	50%	100%	4,111
2021	4,111	4,111	0	2,071	50%	100%	4,111

ship personnel, and the delay in obtaining a final diagnosis on a confirmed sick ship.

Table 1 shows the work carried out by the RNMMMS units from inception to 1979.

It may be of interest to note the results of investigations of those considered to be abnormal and reported to the RMOC LONDON. Although insufficient information is available to allow investigation into categories of persons a report, of the many significant conditions recorded only a few of the numerous diagnoses are mentioned.

Active Preliminary Tuberculosis

1971 1972 1973 1974 1975 1976 1977 1978 1979

1971	1972	1973	1974	1975	1976	1977	1978	1979
1	1	1	1	1	1	1	1	1

There is a noticeable peak in cases found on unconfirmed personnel with the increased efficiency of the navy service in 1971, tapering off over the next four years (Table 1). The figure for 1979 does not include some cases where diagnosis is not yet known. It is however apparent that even still even in RN unconfirmed personnel despite their being a largely hand picked fit young population and it can be hoped that the abandonment of annual chest x-rays does not result in this figure rising again.

Adverse Fiscal Reaction

Ignoring the large number of civilian MOD employees whose x-rays show changes consistent with exposure to asbestos dust, and which have already been the subject of investigations reported elsewhere by the Medical Research Unit, a number of long-serving RN unconfirmed personnel continue to show such changes in their routine x-rays, presumably following exposure to asbestos dust on MOD ships in previous years. The figures for those who have been investigated and referred for further surveillance are shown in Table 2.

1971 1972 1973 1974 1975 1976 1977 1978 1979

1971	1972	1973	1974	1975	1976	1977	1978	1979
1	1	1	1	1	1	1	1	1

As far as is known to the author none of these patients has shown the long changes of fully developed asbestosis. However, as almost all are over 40 or over 45 years service prior to the changes being recorded, whose further x-ray surveillance is not carried out by the RNMMMS and who in many cases will have retired from Service career shortly after being noted as unthoughtful circumstances can be made from these figures.

Pulmonary Emphysema

This condition has been noted steadily over the period (Table IV). There has been

TABLE IV

Year	1	2	3	4	5	6	7	8	9	10
	1	1	1		1	1	1	1		

no definite grouping by age rate or type of personnel on investigation always all have shown no disability and in that small proportion where final outcome is known to MCH (EMMMS) 6 of those RN unemployed personnel who after some years have reappeared in the MMR almost a very quietly that chest appearances have completely returned to normal.

Pulmonary Neoplasm

The greater proportion of cases recorded over the years has as might be expected from the age groups concerned occurred in civilian MOD employees (Table V). The

TABLE V

Year	1	2	3	4	5	6	7	8	9	10
	1	1	1	1	1	1	1	1	1	1

condition in any in which the figures are particularly suspect, largely owing to the reluctance of many "perk ups" where a rising was merely voluntary to provide information on the outcome of investigations. Although in the opinion of the radiologist this a man was highly suggestive of neoplastic changes the final diagnosis is not known.

It is difficult for the author who has not only been the radiologist in charge of the RN Main Maritime Radiographic Service from its inception but has since 1941 had intermittent connection with the RN Main X-ray Unit, to make an objective assessment of the value of the radiologic data in the later years. He would, however like to record his admiration for the dedication of all staff—unemployed and civilian, who have worked in the EMMMS under his supervision. He believes that chest efforts have been invaluable in maintaining the high standard of medical fitness required in Royal Naval personnel.

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Data Analysis II. Some Statistical Methods for 2x2 Tables.

R. E. Fienberg

ABSTRACT

First, this paper and data table are presented as they are; the computer also captures all data. For small data, the 2x2 table is a computer program for the calculation of one of the classical chi-square tests and the exact binomial probability test. In comparing the two procedures, however, the direction of the data on the timing differences in proportion is important. In a 2x2 table, a group is "positive" if it has a higher proportion of successes and "negative" if it has a lower proportion. In a 2x2 table, the direction of the data on the timing differences is important. In a 2x2 table, the direction of the data on the timing differences is important. In a 2x2 table, the direction of the data on the timing differences is important.

Introduction

The 2x2 table is probably the most frequently employed method of presenting statistical evidence. The classical chi-square test is a simple (in computational terms) statistical test which can be used either to assess the significance of association between the rows and columns of the data table or to test for differences in the response proportions (outcomes) in two groups (rows). The researcher can easily apply this test without paying too much attention to how the data arose. For instance, consider the table presented below showing a breakdown of reported deaths and illness occurring for 7 days within two birthweight groups — less than 1000 gms. and 1000 to 2500 gms.

This table could have been obtained by one of three approaches — (1) the 1000 gm and smaller (all infants weighing 1000 gms or less at birth) occurred approximately in time over a one year period and were classified according to birthweight and outcome; (2) two samples of 114 deaths and 482 survivors were separately measured

	Deaths	Survivors
Less than 1000 gms.	114	482
1000 to 2500 gms.	114	482

and classified into birthweight groups; (3) two samples of 114 and 482 infants weighing less than 1000 gms. and 1000 to 2500 gms. respectively were classified by outcome. In case (1) both sets of marginal frequencies are random variables, so is the double contingency classification; we now consider a statistical test concerning the independence of birthweight and outcome. For either case (2) or (3) one margin is fixed and we can consider statistical tests appropriate to testing hypotheses concerning the latter or the unknown margin or proportions (e.g., in case (2) proportions of very low birthweight or case (3) The latter tests are proportions) are referred to as tests of homogeneity. As the null hypotheses are different in the three cases, the p-values drawn from the data can well also be different.

A fourth way (case (4)) in which a 2x2 table can arise is easily demonstrated with an example. Consider a human subject who is asked to perform a motor test. From the test he is instructed that over a 30 minute period 30 motor pulses are required in unequal time intervals. 30 pulses are of

element short duration and 10 s or longer. The subject is made aware that he must make 10 possible long pulses. After a practice session the results are given in Table 2.

TABLE 2

No. of long pulses	No. of subjects		Total
	10 s or longer	less than 10 s	
1	1	1	2
2	1	1	2
3	1	1	2
4	1	1	2
5	1	1	2
6	1	1	2
7	1	1	2
8	1	1	2
9	1	1	2
10	1	1	2
11	1	1	2
12	1	1	2
13	1	1	2
14	1	1	2
15	1	1	2
16	1	1	2
17	1	1	2
18	1	1	2
19	1	1	2
20	1	1	2

Here is a situation where both margins are fixed and one cell value is fixed; the table determines the remaining cell frequencies. The researcher is concerned about the degree of association between the subject's time measurement and the signal pulse time — an appropriate statistical test has been put forward by Fisher.¹

So far consideration has not been given to studies where subjects are matched with controls on a 1 to 1 basis or where subjects act as their own controls in a comparative trial of two treatments. Two statistical tests (McNemar's G test²) associated with these studies are discussed later, but let us first consider the statistical tests of various hypotheses associated with cases (1) to (4).

Case (1) Test of sum of cell frequencies fixed

The method of sampling employed in this case is often referred to as cross-sectional, simultaneous or multistage sampling. The only constraint on the frequencies is the overall total.

TABLE 3

Treatment	Response		Total
	Yes	No	
1	a	b	$a+b$
2	c	d	$c+d$
Total	$a+c$	$b+d$	$a+b+c+d$

The above table represents a 2x2 table

with two categories for each factor (supposed to be + and -). The A, B, C, D represents the cell frequencies and N the overall total.

The null hypothesis H_0 is no association between factors 1 and 2 and the alternative hypothesis H_1 is some association between factors 1 and 2. The test in (1) tested if in H_0 we do not specify the direction of the association which has a two-sided test or whether in H_1 a specific association (say positive).

On the basis of the null hypothesis the expected cell frequencies can be calculated as the expected frequency corresponding to the cell containing A is $(a+b)(a+c)/N$.

For testing the stated null hypothesis the χ^2 test (with one degree of freedom) is applicable provided N and the expected cell frequencies are sufficiently large.

The test statistic is

$$\chi^2 = \frac{N(a+b)(a+c)(b+d)(c+d)}{(a+b)(a+c)(b+d)(c+d)} \quad (1)$$

where the () means absolute value of the expression contained in the brackets. The numerator term 0.25 is referred to as Yates' correction for continuity.

Cochran³ made some recommendations on the use of the χ^2 test for 2x2 tables. For N greater than 40 use formula (1). If N lies between 20 and 40 use formula (2) provided all expected frequencies are 5 or more otherwise use the Fisher test (see below). When N is less than 20 always use the Fisher test.

Assuming Table 1 as a suitable case (2) we obtain $\chi^2 = 15.7$ (1 d.f.). The highly significant result implies a relationship between parental mortality and birth weight for low birthweight infants — a detailed analysis of the relationship is contained in Partridge's PhD thesis.⁴

Fisher's Exact Probability Test

When the marginal totals are fixed the exact probability of observing the set of

visions may be used when a comparison between two drugs is made under the restriction of one drug per subject. The subjects are randomized to one or other treatment group and the proportions responding favourably may be tested for equality or not. In some situations it may be legitimate to match pairs of subjects with one individual of a pair randomly assigned to one of the drugs and the other individual of the pair to the control drug. Alternatively each subject could be exposed to both drugs at different times. At the planning stage it is important to be aware that some carry-over effects or environmental changes may occur during the trial.

There are two standard tests (due to McNemar² and Gadj³) which may be used in assessing any 'response' difference in the two drug schedules. We could summarize the following data tables to analyse (a) matched pairs of subjects split between drugs X and Y, or (b) each subject assigned to both drugs with administration order randomized such that half the subjects take drug X first followed by drug Y and the remaining subjects take the drugs in the order Y-X.

Diagrammatically the information can be presented as in Table 5 (A, B-C, D are cell frequencies).

Table 5

	Drug Y	
	no response	response
Drug X	a	b
Control	c	d

The McNemar Test

In paired samples only two cells (B response to Y, no response to X and C (no response to Y, response to X)) contribute to the statistical testing of differences between the two drugs. The McNemar statistic is

$$\chi^2 = \frac{(b-c)^2}{(b+c)} \quad (1)$$

where also 1) means absolute value of the expression contained in | |. The statistic is distributed as a chi square with one degree of freedom under the null hypothesis (i.e. no difference in response to drugs X and Y).

Although the test statistic is based on two cell frequencies only the treatment of proportions responding under the drug schedules do require all four cell frequencies to be known.

An example

A pilot RCT study investigating two treatments of motion sickness has been conducted on a cross-over design, tests to assess possible side effects associated with two drugs. The full details of the trial design and results obtained are being reported elsewhere and only a brief outline of one aspect is given here. Thirty five subjects on one ship provided suitable 'response' data in both drugs and the numbers of subjects reporting headaches under either drug are given in Table 6.

Table 6

	Head 12	
	Head 12	No Head 12
Drug 12	10	5
Drug 13	17	12

The test statistic therefore $(\chi^2_1 B^2 = 0.28)$ is insignificant and we conclude that on this pilot study the null hypothesis (headaches occur equally with both drugs) is not rejected.

The Cox Test

One drawback of the McNemar test is that no allowance is made for possible order effects which may arise from any carry-over effects of the first drug, or changes in operating or environmental conditions applying at the relevant trial test times. For example in the RCT motion sickness treatment study no control could be exercised on one trial another condition was on the ship's operating programme. To

minimum possible randomization to ship motion the subjects started the drug schedules X and Y at the start of two sittings following a period of three days.

The numbers of subjects reporting headache/nausea/dizziness either drug X or Y on the first or second sitting run are shown in Table 7.

TABLE 7

Treatment	X	Y	X or Y	Total
	1st	2nd	1st or 2nd	
Headache	10	10	10	30
Nausea	10	10	10	30
Dizziness	10	10	10	30
Other	10	10	10	30
Total	40	40	40	120

Chen² has shown how the data can be analysed for drug effects in the presence of order effects. Similarly, order effects in the presence of drug effects can be tested. The statistical tests rely on the information contained in the last two rows of Table 7 and are formally equivalent to Fisher's exact test for the usual 2x2 table. Application of Chi's rules yields Tables 7a and 7b for testing drug or order effects in the presence of possible order or drug effects respectively. The reader should note the cell positions in Tables 7a and 7b.

TABLE 7a

X	Y	X or Y	Total
	1st	2nd	
Headache	10	10	20
Nausea	10	10	20
Dizziness	10	10	20
Other	10	10	20
Total	40	40	80

TABLE 7b

X	Y	X or Y	Total
	1st	2nd	
Headache	10	10	20
Nausea	10	10	20
Dizziness	10	10	20
Other	10	10	20
Total	40	40	80

Using formula (2) the probability of the arrangements in Table 7a (and more extreme arrangements) under the null

hypothesis of no difference in drugs is $p = 0.01$ or no significant difference in headache occurrence under both drugs. However, the probability of the arrangement in Table 7b and the more extreme arrangements under the null hypothesis of no order effects is $p = 0.045$ or significant order effects when allowing for possible differences in response to the drugs.

Dr. Mo Nien²¹ investigated the power functions of McNemar's and Chi's tests and showed that the p -value of McNemar's test is dominated by the order effect and Chi's test is, on the average, less powerful than McNemar's test when the order effect is zero. He suggests that Chi's test is preferable if the sample size is small. For large sample sizes, and unknown order effects the researcher could use a preliminary test for order effects before examining for drug effects.

Concluding Remarks

The researcher should decide at the planning stage what relevant questions he is trying to answer and adopt appropriate methods of data sampling and collection. The methods of analysis should take into consideration the sampling method employed or are we using matched or unmatched samples, and are we selecting a relevant statistical test for the situation? In the related samples case (eg. a 1950-1960 drug) there may be order of tests which the researcher cannot control for during the course of the study and the analysis must allow and adjust for these effects when assessing for possible differences in the main factor of interest. The article discusses a few of the alternative methods of analysing 2x2 tables, for complex situations the researcher is advised to consult a statistician.

References

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When You've Heard the Last a-Cablin'

D. P. Gaud

And so we went off to Hong Kong on a merchant ship which carried about 150 passengers and a good deal of freight. There were about 30 naval officers on board taking passage to the Far East and it was interesting to record that every one of us looks back on that voyage with nostalgia and affection. We formed a kind of club on that to this day when we see one another we always make conversation with some form of greeting although it is almost half a century since we left Liverpool on that spring morning.

Our first call was to be Mizanin and the captain had regaled me with prospects of a very exciting run indeed which he had planned for me but this was definitely postponed by the ferocity of the weather. It was frustrating to watch the fringe of the landscape completely disappear under green waves and I found that about 50% of the passengers had temporarily deserted. We only stayed a short time at Mizanin and proceeded with speed to Port Said which was my first experience of what was then called the Near East. The atmosphere was not very legions or salubrious. We were continuously harassed by Arab raids, killing camels and herds of cattle and if they failed to achieve this they used unaccountably close, and suggested that for the payment of a small sum we would be privileged to witness various and sorts of unsatisfactory

disgraces. Our only escape from this was to stay at hotel where, though the buggies were kept out we were assailed by persistent endeavouring to sell us improper books. This literature would certainly not have passed the Board of Censors in the U.K. at that time but would probably now be considered suitable for distribution at school prize-givings. Looking back one should not blame these sellers of improper books and pamphlets, of other unsuitable articles as they were only protecting what the ordinary tourist demanded and as their own previous lives were no doubt very poor but almost joyful.

We spent a short time at Suez which was a little more representative of the Near East than Port Said. The state of hygiene at the time was not very good and the inhabitants looked rather dejected. It was, however, interesting to say a Jordanian noble on a camel, took it to a lamp post and used a ghayr made on board.

We then proceeded to Aden where it was possible to have a view of behind water sailing to keep off the sharks. There was a big tourist industry then with many carpets on show samples of which many of our passengers acquired. The thing that I shall always remember was seeing ships. Two ranges were placed on the ship's side up which the men and women ran with baskets full of mail which they discharged onto the ship's benches, some men with empty baskets down the other ramp where they landed the feminine stores of gaily. They were running

The first part of the author's reminiscences, *As a man in the Shipping*, was published in the December 1958 Journal.

up and down at great speed and in the heat of the day I watched them carry these heavy baskets with a look of despair on their faces which I guess was not still. The females who suffer from such things and I am glad that most shops now take in their feet by way of an act of piety, although this may have resulted in a certain amount of local unemployment.

We went from Salem to Colombo, a very interesting city where it was interesting to watch the pavilions at work, seeing some processions, dances in the great squares and observe village houses. We went to the cinema club to see if it was possible to have a game and the secretary an Englishman was deeply shocked, telling us that he was quite sure that no European would participate during the heat of the day. He did, however, produce the club members who were a long garment like a nightgown and covered a mosque which was not quite in shape. The market was a running place and the only way to survive here was by high tide, which caused him to run backwards, so getting his feet covered with the hem of his nightgown. He was, I remember, just the same.

Singapore at that time was not as important as it is today. It was nevertheless interesting to see the mixture of Malay, Chinese and Tamils. During the streets the Chinese are ever full of rage and contempt. The Malays were relaxed and I was told, less relaxed in the heat of the moment. A good deal of the manual work was done by the black Tamils from Southern India.

In shops going out in the Far East it is useful for one to be given a lot of advice by someone on arrival in duty. One man told very hard tales of a red light quarter in Singapore in which the women were in cages and received instructions to the powers by One of the passengers. A boy, elderly dressed travelling on a long boat with his wife was absolutely fascinated by this and on our approach to Singapore could talk of nothing else. It was greatly explained

to him by a mature and sensible resident that this particular form had been almost abolished and replaced by Europe. The little dream, although disappointed, was by no means crushed and ended particularly that he should be accompanied to the sea where these night women had once gathered. This was acceptably carried out and I remember that I was one of the party who went with him although I am not quite sure how he derived his wife during that period. He saw the new factory buildings and confirmed the married life, after which he seemed to be perfectly happy. These Eastern residents seemed not very particularly about having anything to do with oriental girls, especially the girls of mixed blood. Apparently careers were caused by the loss of something and many a promising effort had had to go home in despair because of it. I remember going to an entertainment called the Great World which was held in a massive mosque and witnessed several Chinese theatrical scenes, dances and also during performance of these dancing girls were the result of unconscious between Europeans and Malays and were sometimes of almost unbelievable beauty so that the over-enthusiasm of the efforts at least produced some long passages in the eye.

We visited Penang for a couple of days and then set out for Hong Kong, our final destination. We arrived there in the middle of a very humid afternoon and I think the Commander was somewhat disappointed that we had come on board in phylloxera. I was not particularly worried about this the pleasure as I was not the senior member of the party. I was now a ship's medical officer in general practice. This practice consisted of the treatment of all forms of minor diseases and injuries, the chief being skin diseases, venereal diseases and gastroenteritis. Venereal diseases presented a very great problem in about 5 per cent of the ship's company were usually under treatment. The treatment itself was certainly very crude.

quite as far as gastroenteritis was concerned as it seems to be established that in those days there were no antibodies of any kind. The treatment of typhoid was more effective and could be carried out by intravenous administration and subcutaneous. Inasmuch as gastroenteritis is a miserable disease the matter here was looked at in at least typhoid presents the possibility of a few years of debilitation of patients and hence requires before death comes its cure? Many great acts of history have been carried out by patients in the early stages of debilitated paralysis.

Hong Kong in those days was not nearly so crowded as it is now and had the tempo of an English provincial town. Money was important just as it is now and the great hotels were being built as temples to Mammon. I was to visit Hong Kong several times in my life and found it unique in that the most important man in my gathering appeared to be the one who could sign the largest cheque. Hong Kong was the base for the China Fleet and had a small naval hospital which was entirely inadequate for the personnel it was supposed to serve. As a result a good deal of minor surgery was carried out on board ship and indeed at times when the hospital was absolutely full emergency surgery of a major nature had to be undertaken in the operating theatres of one of the larger ships. The ship had already been repaired which meant that I had missed the operations but we did visit Moulton, Kenna and Clarke. But the best location for me was the Fleet's summer base at Wo lun Wu. The actual territory which we occupied was an island off the central town of Wo lun Wu and of all the places I have ever visited it is one of the few in which I would really like to return. The climate in the summer was really marvellous - the atmosphere never got too warm and the sea was bracing. There was excellent sailing, a miniature golf course, tennis courts and facilities for cricket and football. There was a very fine Fleet Club but

the ships company which had been the largest member of the Officers' Mess. The Officers' Club was less polished but very pleasant and the food which could be produced at a very modest cost was excellent. It was used on those days for a very doctor to serve part of his time in a large ship and part in a garret and I was duly appointed to a garret on the West River.

I was filled of patients joined the great rest of China. Some men of them looked after the Yangtze river - another five were on the West River and based at Canton. I presented in Canton by now situated in just my garret which was long off Shamone. Shamone is a small island separated from Canton by a small stream of water crossed by several bridges. The inhabitants of the island were all European. They were the various consular officials, members of the two larger banks and also representatives of the large commercial undertakings such as Jardine Matheson and Butterfield & Swire.

Our garret was very small. It was occupied by the Captain, First Lieutenant, Medical Officer and 35 ratings. There were also 15 Chinese, some ten of whom were auxiliary women. There were no bathpans for bathing and to keep the body clean was a very difficult and undignified procedure. We therefore had an arrangement with various friends to share to take baths at their houses. We usually went alone and played tennis, prior to going for a bath and without being told the Chinese boys on board would voluntarily bring our evening clothes to the nearest house. After a few sets of tennis it was very pleasant to go to a nice cool house where one's bath was ready and evening clothes properly placed on a chair with a whisky and soda bubbling merrily on the dressing table. The boy would put our used tennis clothes in a bag for laundering on board and before leaving would request details of the evening's programme. Sometimes we would share

where someone was told to look to day on board, but occasionally we would go to the Captain's Club and meet one or two friends in the bar taking them back on board for a meal. In this case a meal would be, fairly new to the ship by comparison and their an appropriate reward. A meal would be prepared sufficient for the number of guests. It was certainly plentiful and the staff seemed on top of any occasion and everything went off very well. I wonder what the First Union of today would think of this kind of service?

One evening when bringing some guests on board I thought, then through the galley as they were brought to the table how we could produce such a rich short notice. The chief cook was coming on a meal as an expert when his kitchen helper was doing all the work. A further happened to be oversteering our way and I had just realised that I thought most of our cooking was done by pigs when, on running the boards a large Maudslayi duck flew in to through to give my kitchen greater credence.

Our captain, Lord Shannon at the various race parties invited a great deal of foreign ship. The Europeans in these parties were delight of us as we as they probably had not seen anyone from their own country for several weeks. It was open, delightful for us but we were only 24 or 48 hours away from the last gathering and would gladly have accepted a rest. It so happened that the ship had to leave early in the morning the Captain and the First Lieutenant would have the party alone making and making me to remain and had not time. On returning to the ship between 2 and 3 o'clock in the morning I don't think that these duties were somewhat outside my normal of service.

It was wonderful to see the island again of South China and to see celebration as it had been for centuries. There were the usual worked ones, the men with their long silk

robes, small skull caps, white socks and felt shoes, men in robes carrying fans and followed at a respectful distance of ten or fifteen yards by their women wives. One saw the pagodas, the of buildings and towers and all sorts of structures engaged in making wood and ivory and other skilled pursuits. The country was in times very beautiful with impressive scenic gorges, while the palaces on the river bank was great and sometimes extremely amazing. One incident which interested me was the presence of a sort of log with about thirty people the rest of a small court sitting on the logs very closely and together while at the stern and a small boat carrying the navigation and his wife together with a few domestic animals. The whole thing seemed to be managed by one man using a large paddle the stern. The most important event on the river for us was the river festival. This brought the usual and usually fine, the Red Empire because there was a great deal of money in that name. The money continued to be this day by having a Master who was a British subject. These captains were extremely elderly and one suspected that their position was not entirely desirable and from one viewpoint as almost very long periods. I remember seeing one captain and telling him that the ship was underway. He refused to believe me but on looking out of the window he could not deny it. I had a time inside his stateroom and he was not really embarrassed. In the course of conversation he had told me that his net possibilities were very considerable as the passengers were liable to stay small boats first in the ship for the purpose of making land. When I had come on board the vessel I had entered in the water on which on the first deck there were buffaloes and pigs. On the deck above there were pigs and hens with some humans. The next deck carried humans and poultry only, while the upper deck was very close with mahogany doors and oak glass windows. I had observed several buffaloes in the course of my journey

from the waterfront to the Capitole a colonel but I did not tell him of this as I felt that it might appear as a probability later.

We became very friendly with two Chinese police who ran a paper station. We first encountered them in a club where one of them was much preoccupied in conversing with a First Lieutenant while his very dignified colleague looked on and very much laid. That night Porky always maintains your dignity—I was very much interested in these men who seemed to us to run their work about as they did. After observing them on all stages of the disease commensurate in a colony where they appeared to be very happy we were advised by the medical officers to work our hands in alcohol. They then took us to their residence and informed us that having sterilized our hands it was also most important to sterilize the laboratory meat in which was dependent for this purpose. There was a flaring on the sides of our white gloves like the Gothic windows in a church and the doorway used in the particular house was cathedral windows.

This meant that just out of whisky just washed the tips of the flaring in other words it was a good three fingers deep. An elderly colored man had been in the Indian block of Germany was working there. He was a very modest, unassuming man and when I observed a publication from America dealing with this particular disease it seemed odd that he had been forced to return owing to the heavy workload and the rigors of the climate. I could not help but feel that "colored" or "negro" might have had something to do with this.

On our returnable evening when I was driving back to the ship from the paper colony with the First Lieutenant I was astonished to see other elephants approaching us in the moonlight. I understood to a colonel the First Lieutenant without words and spent some rather anxious moments until the elephants came alongside the car and I was quite sure that they were very real.

They turned out to be part of a French action which was touring South China at this particular time.

Part of the sensation for the officers and ship's company was abhorring. The phenomenon of a nation of China and at certain times of the past they can be seen in production. I have never been born on blood sports and have never discharged a gun as a living creature in my life but I liked to go along for the walk and to watch the proceedings. On our way out in the early morning when there was still some snow, one of the officers saw a black object walking over it as a field and he flew at it. There was a scream which was very loud and on closer examination it was discovered that his pelvis had become impacted in the back of a woman's head. Her husband arrived on the scene in a few minutes and it was determined that his organs were not serious and that the pelvis could be quite easily removed and her condition was likely to heal up. On such an occasion it was wise to wear into some sort of financial compensation and this was done. The following husband announced that this was not his business why not should she recover he would be very happy to return part of the compensation in as to the rest of our travelling that was again.

After I had been some 20 months on the station I received a cable to say that my father had died suddenly from a cold—much medical bureaucracy. I immediately wrote to the Medical Department of the Admiralty explaining the situation and asking to be released as the subject concerned was. Men were there in those days and was, as never before, later I received a letter from M.D.C. Department representing that could be released telling me that they had no one to relieve me at that particular moment but would do their best. Some six weeks later a signal arrived to inform me that as I had now been two years on the Station I would not be required to pay the passage money for my self from England to Hong Kong.

and I could be expected to find me was, however, then spent. I took the vessel and returned to the moment when I changed the "new blood" itself. The vessel was, with great tenderness and as much more, kept up to get down to the water and on the ground as best I could while he went to see the Commander with whom he said he would see the Commander in Chief that very morning to see what could be done. About an hour later he appeared and the Commander in Chief had agreed the Admiralty to the effect that he thought that to compel me, to make my financial position, would be detrimental would be very unwise and that as my relief was proceeding to Hong Kong in a private capacity, the cost of the passage did not appear to arise. After another fortnight I received a signal from the Admiralty informing me that I would be relieved in the usual way. A passage was made available for me as a troopship and we returned to Southampton by the same route as I had left the UK just a little more than two years before.

The only place we visited which was new to me on the return journey was Malta. We arrived there on the day of the coronation of King George VI and the weather seemed very kind after passing through the Red Sea. I went ashore and found Valletta (and including with its various of various palaces, a lot of private. Rocks of goats and holes in a water, black birds. I liked very much that I should see the island as it was there and, of course, as it turned out I was to spend on the island some of the more interesting and surprising ways of my naval life.

On reaching Southampton I went to the

Admiralty where I was told that I had been selected for a special course. They asked me what I would like to do and I think I probably put public health as one of my choices. However someone had told me that there was no night work attached to it and this was a great comfort, in due course, to be presented to Surgeon Captain. I was then informed that they wanted me to take a course in ophthalmology as I had been an ophthalmic house surgeon. I did not know at this time as I was very interested in ophthalmology and in the diseases of the central nervous system. I was appointed to a three months course at Moorfields Eye Hospital in City Road which was later extended by a month to give me four months in all. It was a most enjoyable period and I took some of the classes necessary to sit for Part I of the Diploma in Ophthalmic Medicine and Surgery which was then held in two parts.

I was asked to report again to the Medical Director General's Department where I was closely questioned regarding my private affairs, being particularly asked whether I was married or about to be married. I pleaded not guilty to both these charges and was appointed to be ophthalmic specialist at the Royal Naval Hospital, Chatham for a few weeks prior to becoming ophthalmic specialist at the Royal Naval Hospital at Malta. I was informed by one of my senior colleagues that this was a very pleasant appointment and that it was fortunate to be selected for it at such an early stage of my career.

Text continued

to be found on 1700 pages of text were written and printed in the 15th century. The manuscript is made of parchment, written in a Gothic script, and is bound in a leather cover. It is a very important work for the study of the history of the book and the printing process.

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This critical period begins roughly six hours after birth and extends up to day four.

These four birds were observed in the following ways:

[illegible]

the world's largest and most diverse, and the only one that is owned and controlled by a single nation. The U.S. Postal Service is a unique institution, one that has been a part of the nation's life since its founding. It is a service that is essential to the functioning of the government and to the lives of the people. It is a service that is provided by a public employee who is paid by the government. It is a service that is provided by a public employee who is paid by the government. It is a service that is provided by a public employee who is paid by the government.

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[illegible][illegible]

growth in volume (14.4% increase) of mycorrhizae (14 µg/g fresh weight) in *Thymus serpyllifolius*. In higher doses, no positive effect on fungal growth (up to 100 µg/g) was observed. The results may be linked to the higher concentrations of a mycorrhizal fungus probably originating from an inoculum in a collecting field, which works on the rhizoids. The mycorrhizal fungus of *Thymus* can be a *Trichia* spp., which grows saprophytically on a substrate (dead roots) and is not a mycorrhizal fungus. It is known that *Trichia* spp. are saprophytic fungi and are not mycorrhizal fungi (Kleczkowski, 1992). The results of the study suggest that the use of *Trichia* spp. as mycorrhizal fungi is not recommended.

The focus is directed onto the main activities that drive the company's working with respect to performance and the focus is on the different and specific types of business activities completed or planned. It is not a vehicle for the firm's financial or other issues relating to management or the company.

When a behaviour modification plan is the best means for promoting a behaviour, approval by parents, teachers, community professionals, and others from a host of community roles from the most concerned to those less concerned, is important. The suggested and suggested-to-behave is a part of the community and is not imposed by some state or agency as the child is in the community. The community is the best place to promote the behaviour and the community is the best place to promote the behaviour.

[illegible]

Every attempt to make these conclusions more so convincing, but all participants said that obtaining further support of the model is an equally relevant universal issue, the literature. One more reference was also discussed by the students (i.e., 1991 in Table 1), and Koppelman (1990) led to an alternative to the use of the diagram. It would result in this result is likely to be used for different, creates a high standard of accuracy and this has generally been achieved although there is some controversy by numerous attempts to, Figure 10

books, although not all were signed and not a signed book is of a kind which could easily be confused for more than 100 pages with numerous sketches of men and what in their minds would then appear to be other confessions.

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with "strongly" opposed to non-organized and actively opposed. However, the strongly organized group and related non-organizers in the group disagreed in the first within-subject discussion. This group was divided to explain, participants observed broader positive changes, participants regarded the government as corrupt (including Martin Luther King assassination) and the other important changes. Later, a participant suggested another way to fill gaps and correct errors, and subjects who responded accordingly.

[illegible]

The various phases in his career showed that Shogakukan is not only a company but also a community. Shogakukan's growth was guaranteed by strategic human resources. The present state of knowledge of the conditions is varied and there is, however, no doubt as to the fact of the changes in the role of employees of the firm.

Other professors such as the always popular Scott Branson, former chairman of Eastern Illinois, are scheduled to give addresses. And "Personal Classics" is likely to be a highlight for many.

There is a substantial overlap of the health care system between and of countries, despite the political and economic differences. The changes in health care have been dramatic. In many ways, they have made the health systems more efficient and more effective. The health care systems have been able to provide more services to a larger population. The health care systems have been able to provide more services to a larger population. The health care systems have been able to provide more services to a larger population.

Local health officers of several counties would be supplied with complete checklists with the public health papers and with public health laws are collecting around and the importance of public health is stressed.

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It was pleasant to see a few excellent individuals and it was somewhat surprising that the 1990-1991 top five performing schools were represented on PHSU's Top Achievement team holding positions in the field were less than second-string. With many new schools in progress the statistics during the first term will improve.

The book is well laid out, logically ordered, and is well illustrated. I am sorry to let this reviewer who, while thoroughly interested, has returned by 19th to 20, to the land of the dead.

There is a small discrepancy of 10 years ago there are, but many advances in the knowledge of the nature and treatment of the various conditions as we find knowledge of medicine and surgery and, by an experience, it is a tremendous change. I do not know where

ARCHAEOLOGICAL THEORY AND DISCUSSION
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Like last year, participants in a series of highly successful efforts to improve the focus and content of programs at the largest hospital systems in the United States learned lessons on motivation.

of the company's assets. The company's assets are valued at \$100 million. The company's liabilities are valued at \$20 million. The company's equity is valued at \$80 million. The company's assets are valued at \$100 million. The company's liabilities are valued at \$20 million. The company's equity is valued at \$80 million.

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This in 1954 would have been awarded for sustained service in the Pacific but nothing could have been done because in 1953's service — the year was when he was still in the United States — he was not in the Pacific.

It was not a mistake to say that he was the greatest of men of the Pacific. It was the greatest of men of the Pacific and the greatest of men of the Pacific.

WILLIAM W. WILSON, JR., U.S. NAVY, RETIRED
 (1914-1980) was born in New York City on November 10, 1914.

William W. Wilson, Jr. was a member of the United States Navy from 1934 to 1954 and was a member of the United States Navy from 1934 to 1954. He was a member of the United States Navy from 1934 to 1954 and was a member of the United States Navy from 1934 to 1954.

His personal collection of photographs and other items was donated to the Library of Congress in 1980.

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U.S. MEDICAL AND DENTAL OFFICERS

ROBERT L. WILSON
 New York, New York

Member of the Royal Canadian Order of St. John



ROBERT L. WILSON

Member of the Royal Canadian Order of St. John

Member of the Royal Canadian Order of St. John

Member of the Royal Canadian Order of St. John

Member of the Royal Canadian Order of St. John

Member of the Royal Canadian Order of St. John

REDAEMED FROM LONELY CAREER COMMISSIONER

Surgeon Lieutenant J. L. Appling
Surgeon Lieutenant J. L. Appling
J. L. Appling

Surgeon Lieutenant M. C. Page

—

APPLY TO THE (MAY 1950)

Surgeon, Rear Admiral A. G. Gentry, M.D., has been
appointed Director of the American Red Cross
Western National Office, San Francisco, California.
Gentry having served as Deputy, Director of the
Western Office for numerous years. He joined the
Red Cross in 1917.

—



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Western Office for numerous years. He joined the
Red Cross in 1917.

MEDICAL SERVICE OFFICERS

PROMOTIONS

To Lieutenant
M. Page, M. A. Page.

To Acting First Lieutenant
J. C. Page.

ASSIGNMENT (MAY 1950)

FORA, San Francisco, California, is assigned to duty, serving as
M.D. in the office. He has served the Navy Medical
Service, California, since 1917. The assignment
from the Commissioning (M.D.) is to serve as
acting M.D. in the office. He has served the Navy Medical
Service, California, since 1917. He has served the Navy Medical
Service, California, since 1917.

—

ROYAL NAVAL RESERVE

APPOINTMENT

To Surgeon Lieutenant (M.D.)
J. C. Page, M.D., as Surgeon
in the Western Office, San Francisco.

PROMOTIONS

To Surgeon Lieutenant (M.D.)
J. C. Page, M.D., as Surgeon
in the Western Office, San Francisco.

To Surgeon Lieutenant (M.D.)
J. C. Page, M.D., as Surgeon
in the Western Office, San Francisco.

RETIREMENTS

Surgeon Lieutenant (M.D.) J. C. Page, M.D.,
Surgeon Lieutenant (M.D.) J. C. Page, M.D.,
Surgeon Lieutenant (M.D.) J. C. Page, M.D.,

—

QUEEN ALICE MEMORIAL ROYAL NAVAL NURSING SERVICE

NEW YEAR BONUSES 1955

General Post Office
Principal Mercantile Marine Salooniers

PROMOTIONS

To Superintending Officer
Miss F. M. Evans, M.B., B.S., M.R.C.N.

To Senior Nursing Officer

Miss C. J. Jones, M.B., B.S., M.R.C.N.
Miss A. M. C. Thomas, Miss D. Williams.

To Senior Chief and Quarters Officer

Miss A. H. Jones

NEW ENTRIES

Senior Nursing Officer, Miss L. Connolly
Miss P. A. Burgeson, M.B., B.S., M.R.C.N.
Nursing Officer, Miss S. M. G. O. Miss L. A. Smith

THE ROYAL NAVY MEDICAL CLUB

The Royal Navy Medical Club was founded in 1905 as a dining club with the purpose of holding the annual dinner for members, but several attempts to the effect of a club where both guests may also be invited.

Membership is open to any medical or dental officer who is serving or who has retired in the Royal Navy, Royal Naval Reserve or the Royal Naval Volunteer Reserve. Medical Surgeon Officers and Practitioners of Civil Medicine are ineligible.

Life members cost about £10 out of the £20 and £300 may become life members and may accept the second dinner and accept it without paying the fee.

The annual dinner is usually held in the Forecastle of the Royal Naval College, Greenwich in September. Details of the arrangements of the dinner, together with regulations, forms, are forwarded on request of the writer. Some private and official guests may be invited to the dinner if space permits.

Life membership is £100 for new members and £200 for life members and applicants should be made in writing to the Honorary Secretary, Medical Directorate General (Naval), Ministry of Defence, First Avenue House, High Holborn, London WC1N 6DT. Details of formal regulations forms and the program of members is enclosed.



For more information, contact: Dr. Robert J. Anderson, MD, PhD, Director, Division of Endocrinology, Diabetes, and Metabolic Diseases, National Institutes of Health, 301 N. Zeeb Road, Bethesda, MD 20892. E-mail: andersonr@ninds.nih.gov. Fax: 301-496-1000. Web: <http://www.ninds.nih.gov>

NOTE TO SUBMITTERS

While the Green budget issues of 1980 are regretted, we must ask our readers to accept a somewhat stronger journal for the immediate future. The costs of publication continue to rise and the second is only just coming to life.

We would like to thank all those who returned their collection of the increased rate — the response was most encouraging. We would also appeal to the many writing method and journal editors who do not use the Journal, but who will nevertheless read this note, to become subscribers and to increase the future of the Journal.

Editorial

In the last number of the Journal a photograph of the Joint Armed Forces Faculty of Occupational Medicine meeting appeared on p.65, the first ever monthly meeting of this new Faculty. This and the current Fourth Symposium of Naval Medicine have got us to the question as to the value of these and similar gatherings. Is, they called conferences, symposia or merely monthly meetings. We can dismiss first of all the commercial "linked column long life" events held at an expensive hotel for a day or in which the same content of a problem rubs their thoughts for a fee, and the attendees pay upwards of £100 + V.A.T. for the privilege of eating, drinking and hearing them.

Any profession needs a medium in which it can promulgate exchange and discuss its knowledge for the benefit of the whole. This Journal hopefully helps in this way. Many papers are read which are later published either individually as separate issues or as supplements to other learned journals. At least one very successful Naval symposium reached a commercial result while another naval specialist society symposium was edited by a Naval medical officer.¹

Over the past 50 years there has been an increasing participation by the Naval Medical Branch, not least through and within joint not only in Service sponsored professional gatherings within the country, NATO or the broader international scene but also within their peer groups of specialists societies such as the Royal Society of Medicine, the Royal Colleges and Federation

of Universities and in the maintenance of many other societies. No doubt that within our branch has linked its participants. Some have become nationally known for their work.

But what value have such activities been to the Service and to the individuals who make up that Service? All funds for post graduate medical education are in short supply in the DSEB no less than in the Services.

Priority must be given to that postgraduate education necessary to meet SAC/Cd requirements. It is money less money in the long for attendance at these professional meetings and a careful scrutiny of such applications to determine its worth, yet one more part of the painful but enlightening process. What good can should we apply?

The presenter of a paper will normally acquire some personal credit. At the same time he represents the Royal Navy and his command and performance enhance both the image of the Service generally and not least his particular. He will also, like the non speaker delegates, have the opportunity of hearing and learning. Both can enter the discussion periods. The informal discussion that takes place outside the lecture theatre, the links and contacts that can be built with other colleagues are less quantifiable benefits but probably equally important. They are, not dissimilar from the most written word. It is far easier at a later date to write or talk to an individual whom one has met face to face than to a name. All of this adds to our common fund of knowledge available

to the Service, either directly through the individual or indirectly through the links he has forged. The difficulty lies in trying to balance the claims of one discipline against another when current funds are limited support both.

Some might say "It's all very well for them but what about me?" The remedy is very much in your own hands — but do not expect to join the great academic conference. As at the beginning, participate in Mutual medical meetings locally, present a paper at an in house meeting. Discuss with your professional mentor the possibility of offering a paper to a specialist society or at some similar forum. Above all learn to be a good speaker and presenter: this must include an acceptance of criticism, valouring the content of your paper, your vocal skills in delivery and your English. Most people enjoy listening to a really good speaker giving a polished performance but the stumbling professor with poor diction is the wrong order and nothing new to say is an anathema to all. Some professions do get away with it but you will not. Hopefully however the day will come when you are invited to speak at a national or international gathering or some other spot — or at least now you have not got voted. But

how? You may have to be more creative than you expect!

Invited to give the keynote address at an Occupational Health Conference, draw under the first one of our colleagues found himself with several additional and unexpected speaking engagements, both formal and informal and including, at very short notice 15 minutes at VDU in the Royal Navy to 200 medical undergraduates at the University of Queensland — a subject which is perhaps far gone in an area personal interest but could have needed more detailed preparation!

As a result we have every reason to be proud of our professional contribution. Despite intense commitments we must continue to participate to the best of our ability to it as Support, Curators or Trustees. The alternative is a return to professional isolation.

References

1. Matthews J. R. et al. Chronic poisoning. *BMJ* 1979; *ii*: 1009.
2. McMillan G. H. G. et al. The industrial child — effects on the young of past and occupational exposure. In: *BMJ* 1979; *ii*: 1009.

Surgical Problems Presenting at Sea during 100 British Polish Submarine Patrols*

J. D. Glaser and R. W. Taylor

ABSTRACT

Aspects of surgical problems in the 100 British Polish submarine patrols are discussed. The 100 patrols were carried out by 100 British Polish submarines and a large number reported surgical problems. The most common surgical problems reported were: wounds, burns, fractures, dislocations, and lacerations. The most common surgical problems reported were: wounds, burns, fractures, dislocations, and lacerations. The most common surgical problems reported were: wounds, burns, fractures, dislocations, and lacerations. The most common surgical problems reported were: wounds, burns, fractures, dislocations, and lacerations.

Introduction

HMS *Porpoise* commenced the first British Polish submarine nuclear deterrent patrol in July, 1968. Since then she and her sister ships *Blowfish*, *Blenny* and *Blade* have maintained a constant deterrent presence with a load-out underway at sea on patrol ready to launch a nuclear Polaris missile should the present or effective deterrent the submarine must remain undetected, yet maintain a constant radio reception capability, and always be ready to launch missiles.

A surgical emergency presenting at sea is daunting in any circumstances but in a Polaris submarine whilst at sea with an emergency might threaten the patrol. If the present cannot be satisfactorily treated on board, a decision must be made whether the patrol can be broken to enable the submarine to return to water close to shore,

and surface in order to reach the nearest hospital. More than 100 patrol hours have completed and so have reviewed the surgical problems that have presented and their management.

Data Collection

Each Polaris submarine carries approximately 175 officers and men with an age range of 17 to 45 years, and they are submerged at sea for up to 40 days. The mean duration of patrol during the period studied was approximately 30 days. We have reviewed the Medical Officer's Journals (MOJ's) and the medical sections of the Polaris patrol reports (PPRs) for each of the first 100 patrols. The patrol occurred in 1968-1978. While MOJ's were recorded for only 95 patrols, the medical sections of all PPRs were available.

Details of the reported surgical problems have been obtained from both sources. Only those problems occurring during the patrol have been reviewed and it is during this period that the medical officer is professionally isolated and that patients cannot be transferred rapidly to shore hospitals.

Results

A record is kept in the sick bay of each submarine of the day to day treatment of medical illness but we have not considered where lesions originated and hence in 106 patients the medical officer made a diagnosis of surgical illness sufficiently serious that a normal practice submarine hospital might be necessary. The medical

*This paper formed the basis of a presentation to one of the 100th Anniversary of Royal Signals and Light Communications Corps Jubilee dinners in 1989.

effices, diagnosis was shown in Table 1. Although many cases requiring dental treatment may not have been reported those that were are listed in Table 2. Thirty-two (37%) patients presented with abdominal conditions. A diagnosis of appendicitis was made in 28, five were thought to have acute gastric ulceration, and one patient presented with haemorrhoids. All were treated conservatively usually by intravenous fluid replacement and parenteral antibiotic therapy. Eleven patients complained of acute low back pain of which at least two were treated by pelvic traction using apparatus suspended on board.

Table 1
Injured patients during 1969 Pelama submarine patrol

Wound	No.	Wound	No.
Head	2	Appendicitis	28
Stomach	1	Ulcer	5
Small intestine	1	Haemorrhoids	1
Large intestine	1	Low back pain	11
Bladder	1		
Penis	1		
Scrotum	1		
Rectum	1		
Perineum	1		
Testis	1		
Penis	1		
Scrotum	1		
Rectum	1		
Perineum	1		
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They receive no pay for submarine service but there is considerable sympathy towards submarine appointments.

The effectiveness of the submarine depends on those men who must be able to carry out their duties at all times. It is important that the crew go to sea physically and mentally fit and that they remain so for the duration of the patrol. Sickness can place a strain on the crew as the man remaining on a particular watchstand will be required to work additional hours to meet the deficiency. Ultimately serious illness may cause a patrol to be broken. The medical officer is appointed to a Polaris submarine to prevent or manage these problems.

The sick bay, as having one or two bunks are provided for nursing patients in no larger than a sleeping compartment on a trawler (Fig. 2). An emergency operating theatre can be rigged in the Service Stores room (Figs 3 & 4). Two medical consultants (24 hours) find that these men have been treated



Fig. 2 The Sick Bay.



Fig. 3 The Service Stores Room. A surgical theatre.

specifically in health physics and atmospheric control. They have only basic training in resuscitation and almost no surgical training experience.

All submariners are medically examined before being accepted into the submarine service and those that are possibly exposed to radiation are examined routinely. Additionally the crew are routinely examined during each patrol cycle and it is usual for a dental officer to come on board as the submarine returns from patrol to assess a higher radiation. Pre patrol medical questionnaires are completed by all members of the crew and these are examined by the medical officer. Thus it is hoped that symptoms of serious disease may be identified and the necessary investigations completed before the submarine sets on patrol. So it



Fig. 4 The sick bay.

potentially sick men which followed their deployment and may be replaced.

The medical officer receives the same basic training as all submariners. In addition, he receives training in radiation medicine, health physics and atmosphere control as these will be his special responsibility in the submarine. He also attends a short clinical course on the management of surgical and medical emergencies at sea. Medical officers appointed to submarines are frequently young men undertaking their first post-qualification appointments. Few have more than modest surgical experience. Nevertheless, they take up their appointments with the prospect of having to manage single-handed any surgical emergency in an environment quite unlike that in which they may previously have worked. A small medical library is carried but the medical officer cannot consult a colleague or discuss radio telephone advice as this would reveal the position of the submarine and thus break the security of the patrol.

It is usual for the medical officer to make a journal to the Medical Director General (Naval) recording the interesting events of each patrol. MOs were not available from every patrol but it is likely that any signals of surgical emergency would have been recorded in the PFR which is compiled by the commanding officer and contains a medical section. We have reviewed the PFRs from each of the first 100 patrols. Although 26 dental patients were reported, we believe that they do not represent the total number as many medical officers become tolerably proficient in dealing with dental problems and do not consider them worthy of report.

The number of personnel reporting sick in our studies was one surgical patient per 7,000 man days which compares well with the study by Wilkes of medical wards during 300 American Patient patrols.¹ He reported

100 surgical patients during three million man days submerged at sea, that is one patient per 7,000 man days. Dental patients are excluded from these figures but it can be seen that one surgical problem might be expected during each patrol which is approximately 5,000 man days.

Perhaps the most difficult diagnostic problem is confirmed a medical officer at sea is the acute abdomen. Abdominal conditions constituted the largest group of patients in our series and this was also the experience in the Merchant Navy surface ships.¹ The diagnostic aids available to the submarine medical officer are restricted to simple haematological estimates, routine histology, which the medical officer himself must perform and simple radiology. There are no biochemical facilities and although the portable X-ray machine is suitable for both radiography and a histograph for chest or abdominal examinations. Accurate diagnosis in such circumstances is difficult even for an experienced surgeon and often the diagnosis that were made at the time may be open to question. We have made no attempt to classify or subdivide these. The doctors concerned made their diagnoses in the light of their previous medical experience and the facilities available to them and treated their patients accordingly. Most patients were referred to hospital for consultation subsequently, 12 being transferred to hospital immediately on return to port. All patients returned and were able to resume duty.

Although a full range of surgical instruments is carried on each submarine and an emergency operating theatre can be rigged, a policy of conservatism is generally advocated rather than use of medical officers in the Royal Navy and elsewhere.² Involuntary general anaesthetics cannot be used to relax anyone who would compromise the atmosphere and may be converted to even more toxic products in the oxygen

Incinerators used for atmosphere purification. Trained assistance is not available and facilities for post-operative care are very small. Operative intervention in such circumstances is during one of the most difficult of operations in surgery. Thus the standard of treatment in such abnormal conditions has been intensive: fluid replacement, resuscitative methods and the administration of parenteral antibiotics.

All wound incisions (cuts and stab wounds) are covered on board and blood transfusion is possible in a dire emergency. The blood would be drawn from members of the crew and have cross matching performed. The blood group of most members of the crew is recorded on the medical documents. Blood chemistry cannot be estimated on board, therefore fluid balance is controlled by clinical examination and careful recording of intake and output. Moving a patient in the small confines of the sick bay is difficult and makes the treatment of other patients virtually impossible. Nursing is therefore more conveniently performed in the man's own bunk or, if necessary, in a larger area of the sub marine 'common room'. For the purpose of parenteral solution combined with local anaesthesia has been used to good effect to perform minor procedures whilst intensive regional anaesthesia has been used to permit the manipulation of legs fractured and the treatment of other injuries. Profoundness of the upper limb surface freezing with a small quantity of ethyl chloride has been used for the cushion and drainage of abscesses.

Conclusions

The sources of data used in the preparation of this report were often incomplete and gave scant detail of the management of individual patients. Nevertheless we believe that we have obtained information concerning all the surgical problems which presented during the first 100 British nuclear submarine patrols. All the major surgical problems have been managed successfully with a successful outcome. One point has been broken but there has been no death of any and, to the best of our knowledge, no major morbidity has resulted from delayed definitive treatment. We conclude that the policy of conservative management of patients presenting with a surgical problem at sea is substantiated as justified and should continue to be changed in the future training of submarine medical officers.

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past than it is today. Rum was first issued in 1692, the daily ration was the equivalent of a bottle of today's 50° proof spirit per man and no drunkenness, but not drunkenness was rare. Efforts to control drinking began in 1740 when it was ordered that the rum should be diluted with water — the mixture became known as 'grog'. Following an outbreak in the main station in 1824 and 1830 the prevalence of drunkenness began to fall. In 1856 the Royal Naval Temperance Society was founded by Agnes Weston, who went on board ships to persuade sailors to sign the pledge.¹ Controls of drinking on board and changes in drinking patterns amongst the community as a whole resulted in a progressive decline in gross drunkenness during the first half of this century, but the rum ration was not abolished until 1908 and Wright found that 16% of a random sample of 321 Naval ratings took their rum ration and he considered that the forenoon dose of spirit probably increased the use of alcohol on other occasions. He found that Naval ratings drank far more than a civilian control group.²

The first step towards a more active approach to drinking problems in the Royal Navy was taken with the abolition of the rum ration thus ending the era of official participation in the issue of alcohol to sailors. Drinking within certain limits according to Naval rules is still allowed on HM Ships, but individuals are expected to use the alcohol privilege in a responsible manner.

During the 1970s efforts were made to encourage activities which did not involve alcohol. Naval drinking standards were however inconsistent and some sailors continued to get into trouble with alcohol. When medical attempts of alcohol dependence, which place the emphasis on abnormal drinking behaviour rather than the development of acute problems are applied it is clear that three concerns in the Royal Navy: a number of individuals who exhibit varying

degrees of alcoholism

There is no satisfactory measure of the prevalence of alcoholism in the Navy. The data on alcohol related disciplinary offences and on the numbers of identified alcoholics are no dependent on consistently variables in treatment outcome. In order to partly compensate on treatment programmes, our North American colleagues have estimated prevalence of alcoholism by questionnaire.³ Naval Management in the United Kingdom, however, having considered both the theoretical arguments and the weight of empirical evidence, have taken the conventional pragmatic view that the evaluation of a formal alcohol policy should not be delayed pending detailed investigations of prevalence.⁴ There are four main reasons for current concern about drinking in the Royal Navy: (1) evidence of increasing pervasive alcohol consumption in the UK, particularly amongst young people;⁵ (2) improved understanding of the long and short term harmful effects of alcohol abuse and alcohol dependence;⁶ (3) recognition of an occupational risk factor;⁷ and (4) the changing role of the sailor in the computer age, which calls for high degrees of reliability and efficiency and in which control impairment due to alcohol is inappropriate. The principle of early intervention is necessary to correct undesirable current Naval practices and treatment programmes which aim not only to correct maximum efficiency in the work force but also to attend to the welfare of the individual. Ongoing study of Naval drinking patterns is necessary to monitor the progress of the various elements of these programmes. The pilot study of drinking alcoholics which will now be described forms a preliminary part of this project.

Pilot Study

The primary purpose of this pilot study was to establish baseline profiles of patients in treatment for future comparative studies.

rapidly in improving treatment outcome. The second key purpose was to review data from identified Naval alcoholics as a precursor to a controlled study of Naval drinking which it is hoped may confirm specific risk factors.

Subjects

The subject group comprised 300 male alcoholics who had completed formal education programmes at the Alcohol Clinic, Royal Naval Hospital Haslar and who volunteered for treatment between 1978 and 1980. Although in all cases there was evidence of alcohol-related problems diagnosis was primarily based upon clinical assessment of abnormal drinking behaviour and associated symptoms such as loss of control and diminished ability to respond to external cues to modify alcohol consumption. Diagnostic criteria were relatively broad in accordance with a policy of early intervention and a wide diagnostician concept of the alcoholic condition.

One hundred and eighty-two of the group were serving Naval personnel, two had retired from the Royal Navy but continued to work in the Naval environment and nine were serving in the Royal Marines. Civilian other than retired Service personnel and members of the female branches of the Service were excluded from the study.

It should be noted that voluntary entry into treatment did not necessarily imply a high degree of motivation for change — of one year follow up 74 of the first 100 of the group had maintained either total abstinence or controlled drinking without associated problems but 21 had continued to drink abnormally, contact had been lost with the remaining five.

Method

On entering the treatment clinic subjects completed questionnaires under the supervision of a member of the clinic staff.

Information concerning personal and Service details, past drinking patterns, alcohol related problems, family background and family relationships was requested. As an all self-rated questionnaire accuracy of response could not be guaranteed but the experience of implicit self-revelation had been reported during the formal education courses and formed an essential part of the therapeutic contract. Clinical experience with the alcoholics would tend to suggest that significant over rating is unlikely to occur.

Results

1. Characteristics of the group

The age of group members ranged from 19 to 53 with a mean of 30.7 years. Forty per cent (40%) patients were 20 years or less on entering treatment. One hundred and twenty-three (41.0%) patients had served the Service at 16 years and 59 (20.0%) between 17 and 24 years.

Service status is shown in Table 3. The figures in brackets refer to the relative proportions of each group in the Service expressed as percentages of total strength. Thus the Officer group is under represented and the Senior Rate group over represented.

Table 3
Service Status
(N = 300)

	N	%
OFFICERS	1	0.3%
* SENIOR RATE	90	30.0%
* JUNIOR RATE	209	69.7%

*There is Senior Rates had been referred from a Senior Rates cadre prior to entry into treatment.

When length of service is taken into account (Table 4) it would appear that the proportion of Senior Rates is high at entry of the finding that only 36.0% of patients had served less than 11 years.

30.0% of patients were single, 52% married and 12.0% divorced or separated.

Table 4
Length of episode
(N = 266)

years	%
1 - 4	24.5
5 - 10	24
11 - 20	27
20+	24.5

Fourteen patients had been married twice (7%).

b. Drinking

Patients were asked to state their preferred beverage: 62.5% were beer drinkers, 29.5% were spirit drinkers, and the remaining 8% preferred wine, cider or exotic mixtures such as "Sourp Water" (lemon juice + Perrier).

60.5% of patients stated that on an average drinking day they consumed more than 16 units of alcohol (i.e., half a pint of beer, a glass of wine, or a shot each) out of spirit. 51.5% of patients said they drank between 6 and 12 units, and the remaining 8% claimed that their alcohol consumption was 4 to 7 units per drinking day — these were the patients amongst a drinkers who, on occasions, drank far more.

The majority of the group (147 patients) had for various reasons, abstained from alcohol at some time in the past, but only 12 had recovered abstinence for more than six months.

Detailed examination of drinking patterns is to be the subject of a separate study.

c. Alcohol related problems

Patients were asked to indicate for how long they thought their drinking problems had been present (Table 5). 41.5% of patients indicated between one and five years, 39% between six and ten years, and 12.5% stated that they had been drinking

Table 5
Estimated duration of existing problem
(N = 266)

years	%
one year or less	2
1 - 5	41
5 - 10	25.5
10 - 20	25
20 - 30	4
30+ years	7

chronically for more than 11 years. Only 10% of patients thought they were in the first year of their problem.

With regard to social problems brought about by excessive drinking (Table 6) the vast majority (91.5%) had been in domestic trouble. 58.5% of patients had offended more than five times and the total number of offences recorded was at least 440. One hundred and twenty (45%) patients had committed serious offences (58 (38%) on more than one occasion) and 12 (8.3%) had been convicted of dangerous driving.

Impotence when associated usually called "Eremsy's Group" had been experienced by 12.5% of patients, and 10 of the 39 patients who had been divorced or separated reported that alcohol had been the significant factor in the breakdown of their marriage.

Fifty nine patients admitted to violent behaviour whilst intoxicated: 44 had missed work through drinking, and 28% had been involved in an

Table 6
Alcohol related problems
(N = 266)

	%	N	%
dom. trouble	91.5	243	91.5
offences	58.5	155	58.5
serious offences	45	120	45
impotence	12.5	33	12.5

Anorexia and morning nausea were the most commonly reported alcohol-related symptoms (81% and 84% of patients respectively) (Table 7).

77% of patients had experienced morning sickness and 80% past alcoholic toxemia episodes. 58% of patients had suffered injury while intoxicated, 44% no more than one occasion.

Physical disorders had been discussed with the patients, both during their admission courses and at their individual assessments. 34% had hepatic dysfunction, 28% hypertension, 14% had suffered cirrhosis, and 4% episodes of pancreatitis.

Psychological disturbance, was reported by a number of the patients, 46.8% admitted to feelings of persecution, 32.2% had had suicidal ideas and 39% had experienced hallucinations (22% no more than one episode occurred).

Table 7
Alcohol-related signs and symptoms
(N = 200)

	N	%	N	%
anorexia	164	82	anxiety	94
nausea	168	84	delirium	101
morning sickness	154	77	hypertension	56
past alcoholic toxemia	154	77	epilepsy	28
injury while intoxicated	116	58	hallucinations	76
no more than one episode	50	22		

4. Family background

Although only nine patients had been adopted or childhood, 32% had been brought up by a paternal figure other than their natural father, and 15 by a maternal figure other than their natural mother.

27.5% of patients reported that parental divorce was frequent or constant, and 28.5% reported major family upheavals due to death of a parent, divorce or separation, or to other causes, including chronic disease and absence due to employment (Table 8 & 9).

Table 8
Parental divorce — 40 patients (ages 18-49)
(N = 200)

	N
yes	15
no	24
not known	101
percentage	28.5
yes	1
no	3

Table 9
Major family upheaval — 40 patients
(N = 200)

	N
at least one	1
no	1
percentage	2.5
other causes	45
yes	115

Only 7% of fathers and 9.5% of mothers had been totally opposed to drinking. 88.5% of fathers and 82% of mothers were either abstemious or light to moderate drinkers. Heavy drinking or alcoholism was reported in 38.5% of fathers and 6% of mothers (Table 10).

Table 10
Parental attitude to alcohol
(N = 200)

	Group 1	Group 2
total opposed to drinking	7	9.5
no time at all for drinking	24	2
light to moderate drinking	40	27
heavy drinking	4	5.5
alcoholism	15	13
other causes	3	1.5

Discussion

The results presented here form part of a wider pilot study of alcohol problems

drinkers. The group are not necessarily representative for they had been first selected as candidates for the Alcohol Clinic by medical management and/or medical agencies whose criteria are unlikely to be uniform. In addition the group comprised only those who had volunteered for treatment and remained in treatment long enough to complete the investigative procedures. Thus the data provides a 'baseline' profile of those patients in treatment, but not necessarily of those problem drinkers in general.

In relation to their respective professions in the Service community (Table 3) Officers were under-represented in the patient group (15% vs 14%), Senior Ratings over-represented (40.5% vs 35%) and Junior Ratings slightly under-represented (36.5% vs 38%). There are three possible explanations for the small number of Officers seen: (i) that alcoholism drinking is relatively uncommon amongst Officers, but that alcoholism drinking when present is less detectable owing to the privileges of rank, and/or the nature of Officers' work; (ii) that those who have a drinking problem tend to do their serious drinking outside the Service environment; or (iii) that there is a tendency towards protective voluntary activity amongst the Officers peer group, whereas of course, the main system of referral to treatment facilities, that mentioned but unquoted, still has a function in other professional groups, as those with alcoholic colleagues in the medical profession will recognise.

The over-representation of Senior Ratings (below) is even more marked when adjusted for age (not made for young drinking) is almost certainly due to the probability that Senior Ratings will have been drinking 'chronically' for a relatively long period and therefore be more likely to manifest overt problems. They therefore approach more closely the layman's view of an alcoholist drinker.

It was confirmed that many of the patients had been drinking chronically for

several years (Table 4) which suggested that early identification had not been common during the study period. Medical examination of Service and medical documents of patients attending the Alcohol Clinic between August 1978 and July 1979 revealed evidence of past alcohol related problems more than ten years previously in 12.1% of patients. Since 1978 there has been some improvement in the training of Naval Management regarding the early identification of problem drinkers and this has become an important element in current Naval alcohol policy. The merits of early intervention have been discussed by Clark¹ and are clear if one accepts that alcoholism tends to be chronic and progressive, gross manifestations of damage possibly not appearing for some years after the onset of the abnormal drinking pattern. Comparison of the first and second 100 patients in the general group shows a fall in mean age from 32 years to 29.1 years. The difference in age distribution between these two sub-groups was found to be statistically significant.

Our clinical experience is that this change is due mainly to improved early identification by referral agencies, although it may also be that the reported increase in 'youth drinking' is being reflected in the Naval Navy. It is thought unlikely that the change has been brought about by any major reduction in drinking by the older age group.

The data on drinking confirmed that we are dealing with a significantly damaged group. Some of the results, particularly those in Table 7, were surprising in view of the fact that the patients had, to a greater or lesser extent, been able to carry out their service duties. The relatively high incidence of hallucinatory and persecutory experiences had not been apparent in usual clinical assessment, possibly because patients were unwilling to discuss such matters with a psychiatrist before their experiences had

been explained during the formal interview course.

Part of the family data is presented here to indicate the range of the pilot study. It is not possible to draw any conclusions from this preliminary work, which is intended to form the basis for a more detailed study including a control group.

Conclusions

This preliminary analysis of data from the pilot study has confirmed the presence of an alcohol-damaged group within the Service and established a baseline for comparison with future treatment groups.

Further study is indicated in the treatment group in order to measure trends, to assess factors of importance in treatment outcome, to establish possible 'risk factors' and to compare treatment groups with those who opt out of treatment and with control groups within the Service.

Within the Service community as a whole it is necessary to re-emphasize the prevalence of alcoholism drinking and its deleterious factors which influence the probability of early identification of individual alcoholised drinkers.

Information derived from these studies is required to facilitate the implementation of Naval alcohol policy through improved training of referral agencies, improved provision measures, and optimum therapeutic efficiency.

Whilst it would be naive to expect that alcohol abuse could be eradicated from a community of active young men, this is the

goal towards which efforts should be directed. The task is to encourage the young sailor to take a more responsible attitude towards drinking so that he may, if he chooses, enjoy moderate drinking at the appropriate time, but avoid drifting due to ignorance into a lifestyle which not only diminishes his worth to the Service, but may also damage his health and happiness.

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Spontaneous Rupture of the Spleen: A Further Case Report

P. C. Ronkman

Introduction

A case of spontaneous rupture of the spleen complicating idiopathic systemic disease was recently reported in this Journal from the GP's point of view drawing attention to this rare but potentially fatal complication of a common illness.¹ Spontaneous rupture is rare, however confined to pathological spleens and a further case is reported this time from hospital practice, to emphasize the diagnostic difficulties which the condition presents.

Case Report

A 25 year old previously fit but overweight young man was admitted to hospital at Huddon May 1, 1980 with an 18 hour history of abdominal pain. The pain had commenced suddenly the previous evening following a five mile cycle ride home from a public house where he had consumed his usual 4-5 pints of beer. He denied both then and subsequently any fall or injury to his chest or abdomen. The pain was described as constant in the epigastrium, and he had also noticed on woken on his left shoulder. It had kept him awake all night, he had vomited twice and had passed a loose bowel motion.

On admission he was apyrexial with a pulse rate of 120 beats/min and a blood pressure of 100/90 mmHg. He did not appear anaemic and there was no lymphadenopathy. Apart from tachypnoea the cardiovascular system was normal and the chest was clinically clear. The abdomen was slightly distended but soft with diffuse

tenderness to deep palpation. There was no evidence of peritonism and he had normal bowel sounds. Rectal examination was normal. Investigation showed a haemoglobin of 11 gms/100ml, white cell count $15.2 \times 10^9/\text{cm}^3$ with a normal differential, urea and electrolytes normal, chest X-ray clear and abdominal X-rays showed no diagnostic features. Urinalysis showed a trace of protein only. It was decided to observe him overnight. Later that evening his temperature rose to 38°C but his pulse rate fell to 100 beats/min. During the night he rose to pass urine and complained with severe epigastric and left shoulder pain, but recovered immediately. An ECG was normal.

By the next morning his pain had eased but was exacerbated by movement and on deep palpation. His pulse rate had fallen to 90 beats/min. In the chest an entry was thought to be reduced at the left base and on re-examination of the abdomen there was no usual diffuse upper left sided tenderness with normal bowel sounds. That evening he was pinned again with further right sided upper abdominal pain radiating to both shoulders. He had developed an epistaxis (cycle manner) haemoptysis were reported next morning May 3 and showed that his haemoglobin had fallen to 7 gms/100ml. Blood transfusion was commenced under CVP control. An upper GI endoscopy was normal and urgent serial examinations showed no blood or mucus on the floor. A further chest X-ray showed no evidence of blood in the chest although

duller shadowing was apparent in the left base. Repeat abdominal films suggested slight enlargement of the spleen but showed no other significant abnormality. Further clinical examinations that evening showed guarding in the left upper abdominal quadrant and it was concluded that he was bleeding, were previously. Laparotomy was undertaken in the early hours of the morning of May 4, 48 hours after admission. The abdomen was opened through the abdominal part of a left thoraco-abdominal incision and a large quantity of old blood was found mostly in the upper abdomen. In the left upper quadrant an enlarged ruptured spleen was found wrapped in omentum but was not actively bleeding at the time. The spleen was mobilized and removed after ligation of the pedicle, peritoneal incision closed and the abdomen closed.

Post-operatively he required further blood transfusion and developed a chest infection with left lower lobe collapse, but this responded to treatment and recovery was otherwise unremarkable. A total intra-lumen of 11 units of blood was required. An FFP turned out post-operatively was normal.

The removed spleen weighed 350 gms and showed a large subcapsular haematoma with haemorrhage extending into the pulp in blood filled spaces up to 1 cm thick (Fig 1).



Fig 1. Excised spleen showing the large subcapsular haematoma extending into the splenic pulp.

None of these points showed an established tendency to suggest a pre-existing vascular malformation. Lymphoid follicles were of normal size, many with reactive plasma centres. The red pulp showed no areas of polymorphy, probably as a reaction to haemorrhage but no atypical cells were seen (Fig 2).



Fig 2. Photomicrograph of the spleen showing normal architecture. The red pulp shows typical plasma cells in response to a blood clot on the right. The cellular morphology is otherwise normal.

Discussion

Cases of non-traumatic rupture of the spleen referred to as *congestive rupture* by those authors who distinguish between pathological rupture when there is evidence of underlying pathology and spontaneous rupture when there is none, are reported fairly regularly in the literature, usually as isolated case reports or very small series. The interest shown in these cases would appear to indicate that, although the true incidence is unknown, the condition is rare and a diagnosis is unlikely to be more than one or two cases in his working life. Recent larger series number some of the cases, each have been reported from Lamb² and New Jersey.³

In four of these ten cases the underlying pathology was infectious mononucleosis, in three other cases no underlying abnormality of the spleen could be found. Congestive rupture has been described as a late complication of miliary thrombi involving the spleen and also

in a life-threatening but usually involving the spleen such as disease, pneumonia¹ and pyelitis.² It is evident, however, that in Wilson is apparent no tropical countries at least the commonest underlying pathology is infectious mononucleosis.

The degree of trauma required to rupture the normal spleen is not known, and it is of course possible that cases of spontaneous rupture of the normal spleen are due to minor or forgotten trauma. However, a review of the literature in 1958³ yielded 28 cases whose reported questioning revealed no history of any trauma and there was no evidence of underlying disease. The patients now appear to come into this category. In spontaneous rupture the macroscopic pathology is similar to that in trauma; rupture of the spleen may be evident from its position in the peritoneal cavity. Intra-abdominal rupture may involve the capsule and extend into the splenic substance. A common finding is a subcapsular or intra splenic haematoma, which eventually strips and splits the capsule. A peri splenic haematoma may be partly or completely contained by the peritoneum. Bleeding associated with rupture may be rapid and dramatic, slow and intermittent or delayed for several days or even longer.

In the absence of a history of trauma, the diagnosis of a ruptured spleen is difficult pre-operatively although if a diagnosis of infectious mononucleosis or other splenic pathology has already been made it may be suspected when the patient presents with symptoms and signs of an abdominal catastrophe. Reported clinical features vary but almost all cases have had abdominal pain and tenderness with a leukocytosis and the majority complete or near to the left shoulder.

Many different investigations have been used to make the diagnosis. Reported blood counts may show a progressive rise in or reduction of leukocytes mononucleosis. A chest X ray may show signs at the left lung base and plain abdominal films may show

an enlarging peripheral haematoma. Peritoneal lavage is advocated by McMillan et al but even this may be negative with a contained haematoma. Arteriography has been used. A technique of intravenous arteriography⁴ has been described whereby the spleen may be visualized by giving rapid simultaneous large injections of contrast into each arm via side born common carotides. The diagnosis is made from displacement or distortion of the splenic outline. Computerized tomography has also been found useful⁵ and ultrasonography would also appear to be a possible means of making the diagnosis.

In cases of doubt, or where pain does not permit exhaustive investigations, laparotomy is indicated, where the diagnosis will be obvious and splenectomy can be carried out. The results of splenectomy if performed promptly appear to be similar to its reported cases. However, it is important for the surgeon to be aware of the possibility of small splenic rupture per se specifically or he may be faced with a difficult splenectomy through an inappropriate incision. It is for this reason that a further case of this unusual condition is reported.

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A Lady of Basics

P. Jones

"What? There are four hundred cases done?"

Karen Jane P. v. M.

ABSTRACT

Five cases with back pain as a common factor are brought forward in illustrating the importance of taking a thorough history in establishing a correct diagnosis of patients who "suffer" with minor but very common, frequently isolated, pains. The individual assessment and varied nature of the cases is discussed in the concluding paragraph by the case group medical officer.

Introduction

Opportunities for testing diagnostic systems are not only found in hospital or busy general practice. Although often serving others, the opportunity is essentially one of locality which enables those same Servicemen are often great for the medical officer's diagnostic skill to find the "cases" may grow "growing slow" as isolated single-handed practice.

The aims of this article are twofold:

To illustrate the variety of conditions which even in the limited environment of a set going ship, may present as a "back problem."

To reveal as all of the pitfalls of "labeling" back pain as a rather boring benign condition.

To demonstrate that unusual conditions may be met in a set going appointment.

It is hoped, the article will be of interest and stimulus to all, but particularly to the newly qualified doctor with a patient or forthcoming appointment to a ship.

Five cases are described, each presenting

in the context as a "back problem" of one kind or another but one in which the problems of diagnosis or management are distinctive.

All the cases were seen during the period May to December 1979 during the deployment of Task group 317.8 to Australia. The author was appointed as Squadron Medical Officer to the First Frigate Squadron as well as surgeon to TG 317.8. Five frigates and one DLG were deployed with four RFA vessels including RFA Port Group, whose hospital had been adapted for use as the group surgical facility (Fig 1).

The Surgical Facility

Carrying both four King helicopters and an RFA medical officer, RFA Port Group was used as the hospital for the deployment. The frigates in Port Group complemented a few hundred ward, a large operating area with adequate operating table, a consulting area and resident rooms, four flight deck beds. With the addition of



Fig 1. RFA Port Group.

visible muscular arrangements and our goal exposure is the loss of the former fixed ring articulations. This facility was, clearly the best in the group.

The Problem

One factor of overriding importance in the management of one of my problem involving the vertebral column cannot be overemphasized. A ship at sea is not a stable platform.

In addition to the difficulties that may be encountered in a shore environment by both doctor and patient, account must be taken of the movement of the vessel. The constant constant against and against action of muscle groups already in spasm. Constant or injured and the constant lumbago and heavy spasm all lead to a protraction and increased intensity of pain. With even minimal ship's movement, the maladjusted "bed rest" is not truly rest while with maladjustment the patient quite considerable physical effort may be required just to contain the trunk (Fig 1).



Fig 1. *Protraction/Retraction*

examination was noted examination which revealed a normal sized prostate, tender and very bumpy on palpation with no associated masses of organs prostate that no message. Several under the microscope as an undisturbed and while they had contained large numbers of penicillin debris and a few erythrocytes in each field with no *Prothrombin* results.

A diagnosis of chronic prostatitis was made and, as the nature of backache, for culture and sensitivity a course of Cefix, massive (Bayer) was administered and continued for six weeks. The patient's condition was fully resolved by the end of this period and he had not suffered any further episodes in seven three months later.

Case 2

A 30 year old stevedore attended the sick bay for a one week course of back pain as a consequence of some muscular strain following heavy lifting. He had sustained fractures of the transverse processes of L 3 and L 4 twelve vertebrae as a result traffic accident in January 1978 but had remained asymptomatic, since mid 1978.

He was again asymptomatic but on physical examination there was a dramatic change from the previous week as his coccyx membranes (groin) and nail beds were all deeply cyanosed. Physical examination was otherwise entirely normal.

Case 1

An otherwise fit and healthy 26 year old Lieutenant presented with a five day history of gradual onset of low lumbar and sacral back pain of rather diffuse distribution and of an aching nature with no radiation. Close questioning revealed that, in fact, he had suffered similar episodes over the previous 18 months each one settling spontaneously.

At first an history of any acute injury or other abnormal stresses upon his back and it was only on further questioning, viewed not in the form of a systems review, that he described intermittent aching discomfort after masturbation and an associated associated bilateral muscular ache. He also remembered similar minor gastro-intestinal symptoms occurring with his previous episodes of back pain.

The relevant features of his physical

Admission to the New Zealand Forces Hospital at Singapore and subsequent referral to the Singapore General (Training) Hospital led to the scratching of several medical books but also to a diagnosis.

The diagnosis was found to be due to the presence of *metastomophora*² and that *metastomophorosis* was due to a similar, but distinct, *metastomophora* — the two animals we were all taking in vain needed by the local authorities in the various Pacific islands visited. His condition resolved within a few days. He has had no further problems since having continued on medical prophylaxis with Pictolol.

Case 4

During a ship's visit to Port Moresby Papua New Guinea the author was attending the Australian and British Forces Hospital when a 40-year-old native girl was referred to by two medical. A medical history was the Australian medical officer among her indicated that she had taken some two weeks previously and then presented as an intermittent paroxysm with a tender lump over the base of the cervical spine. Cervical spine X-rays had already been taken and the case was presented for review.

The child was obviously unwell and very distressed but the X-rays did not show the 10-cervical vertebrae. The child was asked what was wrong and she responded to that definition from which he asked the author obtained a history of a sort on Pagan English. It appeared that the child had in fact been ill for several weeks and these dramatic changes had been present ever since this period.

The report then confirmed the clinical impression. On the lateral view the body of the first cervical vertebrae was found to be greatly deformed and that of the second vertebrae partly so. There was a kyphosis of some 40° at the cervicothoracic junction due to bony loss in the tuberculous disease.

The TB group called the following day but it was subsequently learned that the child recovered with conservative treatment.

Case 5

While on duty in Singapore the author was asked to see a patient in an emergency department referred essentially because of his domestic violence work. Apparently he had reported back with back pain some three weeks previously and claimed that his pain prevented him working. Allegations of malingering had been made and were not helped by the patient's rather dramatic posture on walking.

He presented as a depressed, anxious, fearful, nervous, walking with a marked forward flexed stance with a cane in the left hand certainly appeared rather dramatic but on did the general of 39.0°C coupled with the history of night sweats, rapid dyspnoea, anorexia and loss of weight and appetite. Physical examination was equally striking and with a marked scoliosis convex to the right, revealed a full very tender, warm left leg.

A surgery some 24 hours later 1750 c of pus was drained from a left-sided psoas abscess.

Case 6

A previously fit and healthy 21-year-old MPM was quoted from a MMR note on the side of Major Sybil and taken to the local hospital for treatment. He had sustained a spontaneous fracture of the body of the first lumbar vertebrae and a smaller but less serious injury to the body of the adjacent second vertebrae. The fracture was stable and as his only complaint was of back pain he was admitted and treated with bed rest and analgesics.³

As the group of ships were due to sail and as it was felt that bed rest would be continued on the relatively stable platform of BPA, Five Orange the patient under sedation and a sedative and accompanied by

a medical officer and leading medical personnel, was transferred to the ship by a Sea King helicopter. He remained on board for the next four weeks and, from the point of view of his crash diagnosis, he had no particular problems being treated that is, he had no fracture boards. Even so, no large vessel in Port George, however, he did suffer increased pain as waves continued when the sea-state caused the ship to roll.

On the second day he was suffering abdominal pain and over the next 48 hours developed increased tenderness (guarding, rigidity, pyrexia, normal leukocytes and normal bowel sounds). With the limited facilities available and being several days from the nearest hospital assistance, laparotomy was not to be undertaken lightly. It was felt that the intra-abdominal organ could be replaced on the basis of a massive retroperitoneal haematoma with some retroperitoneal laceration and that laparotomy was not required.

The patient was observed very carefully and by day 5 his symptoms were settling and the intra-abdominal organ resolving. Recovery was unremarkable and he was finally discharged to the British Military Hospital Ruxton for rehabilitation and subsequent repatriation.

Discussion

The first case illustrates the importance of taking a full history from any patient with back pain and also serves as a reminder of a not infrequent presentation of what is a common (and I feel often under diagnosed) condition.

Although not a problem involving the vertebral column in such case 2 seems to be a valuable reminder to reassess the whole patient and also re-emphasizes the importance of taking up, in this case, an injury the completion was of a non-traumatic nature but on many occasions it could well be related directly to the original condition.

While case 3 presented with a retroviral

infection of the spine, a somewhat uncommon event for Port a decision of the spine's final pathophysiology was obtained in appearance. Like a top object lesson in the importance of taking a full history in all cases of back pain, this theme with a clear cut story of trauma. No matter how difficult it is obtain the value of the history is only matched by the requirement that the clinical X-rays should show all the relevant vertebrae.

The dilemma with the postoperative ataxia (Case 4) unfortunately follows for all locomotor patients of this condition as discussed in one series where only 18 per cent were diagnosed pre-operatively and 34 per cent at autopsy.¹ This relatively common condition should always be borne in mind in differential diagnosis for a correct significant mortality and again illustrates the practical importance of a thorough history in reaching a correct diagnosis.

The final patient with a back problem of traumatic origin, because of the nature of the late effects of the injury, proved to be a most taxing diagnostic problem. A correct assessment and diagnosis was even more relevant in these circumstances than where at risk of the limited surgical facilities.

Conclusion

Depressed of some of the more common and more serious lesions for investigation and treatment, the ship's medical officer must of necessity fall back upon the basic tools of diagnosis: hand eye and ear. It is this challenge to the medical officer's ability to elucidate physical signs and history in such circumstances which is so refreshing and stimulating. This is probably seldom more obvious than when dealing with the 'bad back' of old.

Acknowledgements

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Skin Disorientation in the Hypobaric Environment: A Pilot Study

R. F. Good, R. Page, G. Whitham and M. F. Lighthall

ABSTRACT

As yet no study has taken any account of the fact that human beings have the ability to detect a spatial change in temperature when the air is cooled to high pressure. As yet no studies of disorientation in the hypobaric environment are taking account of the possibility of disorientation as a result of the decrease in pressure of the subject's environment. The present research is presented as a first step in this investigation.

Introduction

The reduction of temperature in human skin during techniques in military compressed and recompressed spaces over the past decade has resulted in a tremendous increase in pressure versus non-pressure time in pressure. It is a tribute to the training professionals and general forces of the forces that the disorientation prolonged decompression times associated with this work, measured in days rather than hours, have not been associated with a high incidence of serious traumatic or other current illnesses requiring major medical and/or surgical intervention. Nevertheless, the centers charged with providing health care for men living and working under hypobaric conditions must continuously plan against the day when such treatment may be required in a setting which is far different from medical hospital environments.

One aspect of this planning is consideration of disorientation/sensory techniques which could be utilized. General disorientation using techniques techniques is brought with spatial disorientation in a high pressure environment.¹ Inadvertent disorientation may offer an effective alternative for certain surgical procedures and the re-

search that has attracted recent attention.² Large-scale local anesthetic particularly peripheral nerve blocks and spinal and epidural analgesia might logically be considered to have a place in hypobaric care of the problems posed by anesthesia techniques. Various animal work suggests that spinal anesthesia could safely be used for surgical procedures usually performed under spinal block in surface conditions.³ However there is concern that risk of seizures as a result of an altered blood flow on the site of chamber subatmos as a restriction due to possible block from these positive results. These negative results would mitigate against the use of local techniques.⁴

With this in mind, an opportunity was taken during a recent long term experiment due to the high pressure chamber at the Edinburgh Medical Technology Establishment Physiological Laboratory to carry out a pilot study on the feasibility of skin temperature of subjects under extreme hypobaric conditions.

Materials and Methods

During October-November 1980 two young male subjects participated in a full month air chamber pressure exposure in various intervals between 15 minutes (normal). Twelve-hour hours prior to starting compression the two subjects were briefed on surgical planning and histological sampling procedures and given a local practice session. The idea for the

preliminary psychological trial was recovered at short notice so there was insufficient time to bring the subjects to the high standards of a technique involved in the technique of skin preparation and sampling.

Sampling of skin flora at pressure was achieved by means of specially constructed swabs "swabs covered with lambskin velvet. These are similar to the swabs in the "infecta plate" technique used by microbiologists to demonstrate bacteriostatic and bactericidal actions of antibiotics." The effective sampling area of each pad was 30 square centimetres. These were always discarded immediately prior to any rearing, retention of sufficient moisture to obtain the need to maintain them further in the chamber prior to sampling. Six pads one pre and one post, cleaning the skin subject, and two for control purposes were used each day over the six day period of the study. On each sampling occasion the six pads were transferred into and out of the chamber via the handlock, inside a perfumed tin but carefully packed with filtering material and sterilised immediately prior to use. Pre-sterilised packages containing surgical gloves, forceps, gillpans, gauze sponges, cottonwood balls and dropping bowls accompanied the box of pads, with two 20 ml sterilised cones each of a porethane solvent storage solution. Each morning using aseptic techniques, each pad cleaning sample from an area just lateral to the tendo cutis space, cleaned the area three times with standard sterile aseptic peripheral swabs soaked the area for five minutes with gauze sponges saturated with the porethane solvent, wiped off the solvent liquid with one absorbent cotton or periphery swabs and finally took a post-cleaning sample. Pads were carefully replaced in the container, the tin closed and the container then removed from the main chamber via a small handlock.

Culture plates were incorporated in the laboratory by pressing each pad firmly into the surface of the agar, thereby avoiding any lateral movement. Plates were then incubated at 37°C and examined after 24 and 48 hours for evidence of bacterial growth. The six day trial took place during the mid-decompression phase, revealing that the subjects had been conditioned in the limited high pressure environment sufficiently long for skin flora patterns to be established. A three day surface control trial using the same pads on different subjects was carried out for comparative analysis.

Results

Results of bacteriological colony counts from the two subjects, and from the surface controls are shown in Tables 1 and 2. Although several colony types were generally isolated each day, these were identified by cultural characteristics on blood agar plates and subsequent Gram films to be, with one exception, members of the Gram positive cocci species which are well distributed in nature both in pathogens and as commensals on the skin as well as in air and dust. Samples from both subjects on day 5 produced a number of colonies of a Gram negative bacillus which despite producing no demonstrable growth on blood agar medium, was not typical of the coliform group, but nevertheless probably belonged to the family Enterobacteriaceae. Surface controls were without exception, of the Gram positive cocci species.

Random sampling at the chamber interior during the last two days of decompression produced a range of mixed growths of organisms including typical aerobic Gram positive spore bearing bacilli, Gram positive and Gram variable cocci, Gram negative bacilli of the coliform group, and an occasional colony of pseudomonas species. This sampling was not part of the pilot study or originally

Table 1

Results of histological assay (mean) from two subjects (A & B) during investigation from a 140 mm sodium chloride bath

Time (min)	Gross dissection		Σ area		Mean area		Mean area		Mean area		Mean area	
	A	B	A	B	A	B	A	B	A	B	A	B
1	100	100										
2	100	100										
3	100	100										
4	100	100										
5	100	100										
6	100	100										

*Area cleared in all gross dissection records after 45 h immersion in bath.

Table 2

Results of histological assay (mean) from two subjects (A & B) during in surface water bath

Time (min)	Gross dissection		Σ area		Mean area		Mean area		Mean area		Mean area	
	A	B	A	B	A	B	A	B	A	B	A	B
1	100	100										
2	100	100										
3	100	100										
4	100	100										
5	100	100										
6	100	100										

*Gross dissection of the specimen was completed within 10 min.

*A & B subjects in a bath cleared in the left and right sides of the gland and in the ventral surface.

planned and was carried out for interest only as the opportunity presented itself near the end of the day for the absence of repeated washing and rinsing controls further comment at this time would be premature.

Discussion

As suggested, should feature all subjects

apart without harming them. Others, the whole technique has yet to be described as all currently used techniques and dissections have limited and varying spectra of anatomical accuracy. The term "dissection" is generally reserved for an open view on anatomical structures in deepening macro-anatomy. In the non-opening macro-anatomical view can be used as

atmosphere if diluted properly, where are not suitable as an aspirator since they require prolonged contact to be effective. The most widely used aspirators and debrideurs are alcohol, chlorine containing compounds, chlorine and organic iodine preparations, mercuric, and organic mercuric, mercuric, and organic preparations of silver, quaternary ammonium compounds, phenolics compounds, boric acid and other borates, sodium hypochlorite and aldehyde derivatives.¹ In consideration of the standard for first atmosphere control in the hyperbaric closed artificial atmosphere² it was decided to use an iodine preparation for the purpose of this trial.

Povidone iodine is an antiseptic which slowly liberates iodine when in contact with the skin and mucous membranes and is commonly used for pre-operative preparation of the skin. The povidone-iodine preparations are considered less efficient than tincture and alcoholic solutions of diluted iodine, but may be less irritating, less toxic and more convenient to the skin.³ Local hypervitaminosis has been seen only rarely.⁴ Of the proprietary preparations of povidone iodine available, the antiseptic solution containing 1% of available iodine was used. The skin cleaner bore 10.75% available iodine and the surgical scrub 10.75% available iodine were not chosen because it was felt the subjects would have more difficulty removing excess soap film from the skin area to be sampled. The antiseptic solution of skin cleaning and the scrub can be easily wiped off. Gaseous compression, needed in the solution, were applied to the skin for five minutes after the initial cleaning period are since it has been shown that without this additional step, povidone iodine solutions are not highly effective in treating the skin from *Clostridium welchii*.⁵

The present study had several drawbacks. Because of the short, hard case, the tracing of the subjects is not as thorough and the

range of results available for colony procedures was limited so that a full classification of organisms isolated was not possible. The pressure vessels commonly used for the transfer and decompression of samples were in regular use for another study so the sample pads used for sampling had to be transferred to and out of the chamber in a perforated tin box. Although the box was carefully packed with filling material and cushioned on each corner some minor contamination of the pads inevitably occurred as a result of the rapid movement of gas during compression and decompression in the handling.

Although the present investigation failed to achieve complete sterility of the post cleaning samples, the technique in colony counts was sufficient to suggest that full sterility in the hyperbaric environment must be a possibility. As shown in Table 1 of the 12 control pads taken into the chamber environment, none of which were isolated by the subjects, only two were recovered media the chamber being kept continuously during the compression and decompression cycle. Therefore it can be argued that some, if not all of the post cleaning colonies were in fact not organisms derived from the handlock manometer, and not revealed on the cleaned skin. In the subsequent studies carried out, all control pads were sterile as demonstrated in Table 2, perhaps reflecting the absence of handlock manometer. Finally it is observed that the generally much lower colony counts for subject A in Table 1 may reflect the fact that he was under treatment with a broad spectrum antibiotic antibiotics for a draining abscess on his left arm which developed during decompression.

As a result of this pilot trial, further studies to confirm or refute the findings are planned. A number of changes in technique are under consideration, the most important probably being the use of

current study protocol results for analysis of the samples. While skin distribution is only one part of my overall plan for handling a patient in the event of a surgical procedure being carried out in the hypertensive situation it is nonetheless an important consideration which to date has received little attention.

Acknowledgements

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LETTERS TO THE EDITOR

Sir

It was with very mixed feelings that I left the Royal Navy on 27th of the end of April to become the Corporate Medical Officer of English China Clay, Lavington and Pochon Co Ltd, Ashes Key House, St Austell, Cornwall PL25 4DA. I should like to record an open statement to my many old colleagues, especially those in unimpaired health, to mark the end of this, either at St Austell or at home in St Germans, when in the West Country.

I have thoroughly enjoyed my 27 years with the Service which always provided a wealth of clinical and social interest difficult to match, especially in the particular specialty in civilian life I have no hesitations in recommending to those of your readers who have yet to apply for a full service commission.

I know that the Medical Directorate are working on an improved career structure for the Branch with the object of making a full career in the Service truly 'full' and I wish

them every success. There have been many changes for the better since I first joined, moving with and often ahead of the times, and the achievement of regular working days like those which already apply in part on the Army and RAF would remove what must now be the only real deterrent to taking up a full career. If that had already been achieved I should have remained with the Service. Just as I am forced to leave in order to secure my professional need of career advancement.

Finally, Sir, might I make a plea for inclusion in the Journal when financial considerations allow of a section on appointments and other news of those of us on the General List?

Yours etc

J. H. Swain,
Surgeon Captain RN (Retd)

We are always pleased to publish news of retired officers. The flow is however somewhat irregular.

Ed

Causality Handling: The 'Dickson' Canvas Causality Carrying Sheet Mk 1*

A. F. Dickson

Following are described the problem of how to move the casualty from the street to sick bay or hospital has to be solved, ensuring that the patient suffers as little as possible during the move. A variety of stretchers have been devised for use in different situations but all have limitations.

Further difficulties may arise when the patient has to be transferred from one stretcher to another or from stretcher to examination couch or bed. It usually takes several people to lift a patient while providing adequate support for his limbs and head, and the problem becomes more acute in small compartments with restricted access.

In Royal Air Command casualties picked up by helicopter on SAR routes often have to be moved two or three times before arrival at hospital, eg. from ground to lighttransport stretcher, lighttransport stretcher to ambulance, ambulance to hospital unit, and finally to bed or operating table. The use of a canvas carrying sheet has been found to overcome many of the problems involved and has proved very popular with the SAR teams. The patient can be placed

on the carrying sheet before lifting on to the stretcher or the carrying sheet can be placed on the stretcher before the patient is put on it.

The carrying sheet (Fig 1) manufactured locally by the workshop in the establish-ment is similar to the canvas employed in hospitals, with a tube along each side to permit the use of poles if required. In addition it has working handles, four on each side, suitably placed to enable two people to lift a patient without difficulty.



Fig 1. Details of carry sheet.

One person puts his right hand through Loop 1 and grips Loop 2; then puts his left hand through Loop 3 and grips Loop 4. The second person puts one of his hands through Loop 5 and grips Loop 6 while the other hand goes through Loop 7 and grips Loop 7.

*Should prove for local manufacture of the carrying sheet as available from the workshop of the Command Medical Officer (RMAF) only. Avoid confusion.



Fig. 1. The carrying sheet (1900).

The positioning of the webbing handles is important, then, as the head of the carrier being closer together than that of the feet. This means that the weight is spread evenly between the four pairs of handles. It is therefore essential that the person's head is at the right end of the carrying sheet (Fig. 2).

RAF aircraft and ambulances in World Air Command are now normally equipped with carrying sheets of this type. As they can be used as narrow passages with person bending in order to negotiate awkward corners, and can even be used to move a person up or down stairs, they form a valuable and inexpensive addition to the present range of stretchers used on the Service.

Sir David James Hamilton Dickson, MD (1780-1850)

Shirazul I. Ladhani

Tracing the career of Sir David James Hamilton Dickson, Physician in the Navy has been very much like a detective story which began when I was researching the history of the library at the Royal Naval Hospital, Portsmouth. A small number of books have the signature D. Dickson. Who was he? Various Navy lists and an old correspondence register showed that he was the Physician in Charge of Hospitals at the Royal Naval Hospital, Portsmouth 1804-43, but nothing more seemed to be known of him. In order to understand why his books are in the library a further investigation was needed. Eventually something of the personality and character of Dr Dickson came through the fragmentary pieces of evidence despite the gap of over a century, and it seems that the following information might be a useful contribution to knowledge in the field of naval medical biography.

David Dickson was born on January 26 1780: he was the youngest child of the Reverend George Dickson, Minister of Belvoir in Northamptonshire, and his second wife Anna Buckleholme. The eight other children were between five and twenty four years older than David.¹ His mother died in 1794 and his father in 1797 so it is possible that David was brought up by his older brothers and sisters. As the youngest son in a family which seems to have been unable to provide him with private means, it was necessary to prepare for a career in which success would depend upon his own efforts and abilities. Richard Atterbury so that

David was educated as a surgeon.² Perhaps the apprenticeship was less expensive than the direct route to becoming a physician by obtaining a medical degree? Whether this choice of career as a naval surgeon was influenced by any family connection with William Dickson, Admiral of the Fleet (d. 1800) also born Northamptonshire, or with Dr James Hamilton, surgeon at Edinburgh University,³ has not yet been established. Thomas Dickson is not an uncommon name and David Dickson certainly seems to have progressed in his career with no obvious support from influential relatives.

In 1796 he passed his Licence from the Royal College of Surgeons Edinburgh and on July 25 started his career in the Navy as Surgeon's Mate on *French Frederick*.⁴ Four months later on November 14 he was transferred to the *Victory* where he served for nearly nine months and only half seen his first action during the unsuccessful expedition to Holland⁵ when the large Anglo-Russian army landed in North Holland but was beaten by the Franco-Batavian army and forced to retreat. One year after leaving the Navy on July 31 1799 he was promoted to Surgeon and appointed to *Devil*, his fourth appointment followed quickly on April 29 1800 to *Invincible* where he remained for four years. During this latter service he took part in the successful expedition against the French in Egypt in 1801⁶ and probably gained the experience of fever to which he was to refer in his published article of 1818 (vide infra).

In 1804 another series of conflicts occurred

his *Medical Career* began. On June 1 he became 'Assistant in Medicine for a short period' followed on August 25 by 'Physician' until December 29 1804. Seven days later he joined Cove as the 'superintendent of what was to prove a long tour of service on the West Indies, and a significant step forward in his career. His arrival in the Leeward Islands in 1805, and on May 21 1806 became the Surgeon of the 'Northumberland' under the command of Captain the Honourable Sir Alexander Cochrane. In perhaps it was at this time that Dickson formed a friendship with Capt Cochrane's secretary Mr Tracy and later about Drury's sister Agnes who in 1812 was to become Dickson's wife.⁷

Meanwhile, his career was developing. After a few months in *Antislave* (July 25 1807 February 24 1808) he was appointed Acting Physician, Leeward Islands Squadron on February 25 1808. In 1808 he also published the first of many articles in the medical press, perhaps this was sent by him as the immediate student is a useful means of supporting his ambition to be appointed Physician, but it tends to have been the right time for several reasons. Now aged 28, he had gained several years of experience which gave him confidence in his professional judgment; he had evidently spent much time in professional reading to expand his knowledge and his newly acquired MD should help him to obtain a respected reputation. The MD had been awarded by King's College University Aberdeen on August 18 1806. At that time medical degrees were customarily awarded on personal recommendation, not by thesis and examination. Dickson is described in the University records as "Surgeon at the Royal Navy, whose character, education and professional abilities are fully attested by Doctors Keir and Webster, physicians, Buchanan Esq."⁸

Although Dr. Dickson had been involved in naval surgery and must have had

considerable experience of it already, his main professional interest seems to have been in the field that he was to have made his name in upon returning with his first published article on the subject of yellow fever written on board *Antislave* in April 1808 and published in the *Edinburgh Medical and Surgical Journal*.⁹ Yellow fever, he believed, was noncontagious, but diagnosis was very difficult. Black vomit was generally considered to be the most fatal and reliable symptom of yellow fever, but Cochrane stressed that it was the combination of symptoms, not one alone, through which the disease should be diagnosed.

*I agree with every man some respectable authorities that have interpreted as there a parallel between the plague and yellow fever. But after having been twelve months in the Leeward Islands with several sources of information I cannot draw up an explanatory analogy in support of this opinion.*¹⁰

While Acting Physician, Dickson also wrote a letter dated September 1 1808 to the Commissioners for Transport and Sick and Wounded Seamen about the use of inoculation and the topography of viral exanthema in general applications in the treatment of slaves; it was published in 1810.¹¹

Perhaps these two writings had helped to tilt the balance in his favour for Dr. Dickson achieved his ambition as Physician in December 1808, and was credit as a Physician at the Leeward Islands Squadron. During the next four years he served in turn as *Reynard, Pompey and Dragon* and found ample opportunity to study fever, resulting in further publications. His article dated May 1809 on the nature of fever was published in the *London Medical and Physical Journal*.¹² Perhaps more significant was a longer paper on Caribbean fever, which he contributed as a circular letter dated January 1 1810 to the naval surgeons at the Leeward Islands Station. A

noteworthy feature of this Circular is the evidence that Dickson had read widely and deeply in his subject, for he includes frequent comparative references to various writers of medical treatises and periodical articles. The Circular was thought to be so valuable that an anonymous naval surgeon had it submitted a copy without Dickson's knowledge to the *Edinburgh Medical and Surgical Journal*, where it was published in 1840.¹⁰ It was probably because of this indirect submission that the author remains now given as J. H. instead of the D.J.H. which Dickson normally used in print, for he was apparently often known by his second name James.¹¹

It seems that Dickson now found time to devote his own ideas for further material suitable for publication; his next article published in 1841 was an account of a case of angina he had attended some years earlier.¹² In June 1842, shortly before he left Barbadoes for England, he completed an article on the relative use of purgatives which was published in that year.¹³

Dickson's appointment as Physician on the Leeward Islands Station remained on June 31 1842, and he returned to England. As above this time, at the age of 32, he had married 35-year-old Agnes Tracy from Barry in Devon.¹⁴ The sister of the late Secretary to Sir Alexander Cochran.¹⁵ They worked in London, where their first daughter Jane was born on November 16 1843.¹⁶ On June 1 1844 the baptismal record of their second child Agnes Hamilton shows that their address was Palace Street, Oxford Street.¹⁷ Half pay was not a primary motive to support a growing family, but before long a useful new appointment came his way. It seems clear that by this time Dickson had been accepted as something of an authority on fever, and it is not surprising that his next appointment was as Physician on the Barbados fleet in the Melville during the two periods of serious outbreaks of fever there: January 30 1845-April 24 1845

and November 6 1845-March 3 1846, (he himself was one of the many unfortunate British medical officers to have suffered from this fever). These appointments were short but apparently appreciated, for he was awarded the Order of St Vladimir by the Emperor Alexander in recognition of his services.¹⁸ During these appointments Dickson came across cases of ptychiasis, of which he almost immediately published an account because of its rarity in Great Britain.¹⁹ He also prepared a long account of the fever in the Barbados fleet, but did not have the opportunity to publish it as he was rushed away on May 4 1844 to an appointment as Physician of the Fleet and Inspector of Hospitals on the North American Station.

At this time we learn of the friendship between Dickson and the future Physician General of the Navy, William (later Sir William) Burnett. In early 1844 Dickson had been required to visit the prison ships at Chatham, in which contagious fever was increasing, and his successor in that charge was William Burnett. It is interesting to note that in his published Account of a contagious fever prevailing among the prisoners of war in Chatham, Burnett freely refers to the work of one Edward De Dickson.²⁰ It has professional high regard for Dickson written in these sentiments throughout their respective careers, for in 1846 when Burnett was the Physician General of the Fleet, he wrote in his report on Plymouth Hospital: 'It has often been my duty to express in their Lordships the high opinion I entertain of the talents and increasing merit of Sir Edward Dickson.'²¹

Maurice De Dickson was accompanying his former commander-in-chief Sir Alexander Cochran to the American Station, where in the War of 1812, the British blockade of the Chesapeake region had been extended along the Atlantic coast. The overthrow of Napoleon in April 1814 enabled Great Britain to concentrate

to the *New York Herald* and *Illustrated* as Luigi Corbelli, a physician for the Red and New Orleans. Dr. Jackson appears to have been present at the Chesapeake Expedition²⁰ and was certainly present at the disastrous New Orleans Expedition when, in January 1865, over 1000 French troops were killed or wounded in the historic military battle.

It must have been a considerable contrast to arrive in England where once again he reverted to his old job on February 28, 1865. With the prospect of peace, the daily salary appointment, and with only his half pay to support his family in America certainly to set up an arduous process which was permitted although earnings had to be declared. But, he was still a handsome count of money, and by November 1875 he was living in Rathbone Square, High Street, Bath, he seems to have not about acquired some symbolic and personal contacts which could assist him in various positions. He applied successfully to become a Fellow of the Linnean Society of London being described as "a Gentleman expert in the study of Natural History and in like to prove a useful and valuable Member"²¹ He does not seem to have published anything on the subject of natural history, but the letters FLS were regularly used on his later articles.

The way in Bath was brief, by February 1876 he had moved to Clifton and had published up the first article on his experience with the Russian Fleet. *Illustrated* *Discussions on the study of blood being and progress in a first with a preface to the Russian Fleet*²² a typically scientific reference to a wide range of medical techniques. As part of his publicity campaign to develop his practice, the article was reprinted in 1876 and made available as a pamphlet.²³ He made use too of his recent experience in North America by writing a paper on leucemia, for he had met some very severe instances of this disease during the expedition against Mex-

ico.²⁴ On August 5, 1876 he was admitted as a Fellow of the Royal College of Physicians in Edinburgh and the letters FRCP Ed were proudly added to his qualifications. Upon his next appearance in print an article on yellow fever written at Clifton in September 1876.²⁵ In this article he again drew upon his own stock of former years referring to his experience of the leucemia the preceding year at Bahia in April 1867, and referring not only to medical works but also to the works of Humboldt and others on the effect of climate on

Dr Jackson appears to have worked rapidly and professionally, especially on infectious Clifton where by 1879 he had moved from 3 Prince's Buildings into a more fashionable address on the corner of The Mall.²⁶ In 1877 he became a Permanent to Clifton Dispensary. This was a charitable institution founded in 1813, for lying in women and general relief of the poor, maintained by voluntary contributions.²⁷ There were usually two or three consulting physicians, as well as surgeons and consulting nurses, most often from the staff of the Bristol Royal Infirmary. The newly established Clifton Dispensary was already needed and well used in the annual report for 1875 it is recorded that 687 medical and surgical cases were treated of whom 277 were paid, 6 released, 4 discharged as curable, 36 died, 61 remained in care.²⁸ Upon the resignation of Dr. Charles in November 1877 Dr. Jackson was unanimously elected as a Physician to Clifton Dispensary²⁹ and he responded by a prompt advertisement in the local newspaper as *practitioner in style*.

To the local and professional authorities in the Clifton Dispensary Dr Jackson is covering his responsibilities to the ladies and gentlemen to whose support he owes his *Discussions* as FRCP Ed to the Clifton Dispensary, would not do justice to the *Subscribers* and to his own feelings if he failed to express his warmest thanks for

very handsome manner in which they answered him and their notes upon their returns.¹⁰

No less were replied by the Physicians who were usually desired for their valuable primitive services in the past year¹¹ but the work provided Dickson with a useful new dispensation and some interesting cases which he duly published. He had already made a number of useful but professional contacts and appears to have been well respected. Dr Barker of Bristol in a contribution to *Medical Chirurgical Journal* in 1826 on hydrocephalus acrius remarked:

To attempt teaching another after affluence has taken place in *Hydrocephalus acrius* I consider still to promote affluence; affluence may take place and recovery supervene; however if such recovery have occurred under the eye of Dr Dickson of Clifton when he arrived as Physician to the Fleet or least he had strong reasons to draw such conclusion, and the medical world cannot but join me in attaching the greatest importance to the opinion of that gentleman, seeing that of such a fact we cannot have truer demonstration, and knowing his ability as a physician and pathologist.¹²

A spite of articles was published by Dickson in the years 1814-1826 on a variety of subjects: *burns*, *lung disease*,¹³ *hydrocephalus acrius*,¹⁴ *temporal fever*,¹⁵ *phlegmona dolens*,¹⁶ *osteum*,¹⁷ *osteopetia*,¹⁸ and *perforated inflammation*.¹⁹ The explanation seems to be that eleven minutes were just right to maintain Dickson, to publish at this time. But only was there his cause never three, but he was working in the surrounding medical environment of Bristol with an thriving Royal Infirmary and had ready access to medical literature. From time to time he had acquired bursts of his own including successful works concerning the names of Dr. Keenan and Dr. Thomas Norman,²⁰ former Bristol

doctors. Perhaps he belonged to the Bristol Medical Book Society (of which little is known) for he was a friend of Mr. Norman²¹ a surgeon at the Bristol Royal Infirmary who had headed the list of subscribers in 1808.²²

In this fortunate environment Dickson now published a more ambitious work, a pamphlet proposing the setting up of fever hospitals in the United Kingdom and recommending in particular the advantages of setting one in Bristol and Clifton.²³ This work was received at length and favourably by the *Edinburgh Medical and Surgical Journal*.²⁴

Our former author here, from time to time, affected the most majestic pose of the capricious physician, such as an accurate observer and a skilled writer. The reviewer cannot claim his treat without expressing a wish that Dr. Dickson may now present himself again before the public in some work of greater magnitude if not of greater importance.²⁵

The *Medical Chirurgical Journal* continued:

Dr. Dickson's papers on this phytion and accurate pathologist are already well known to his professional brethren. In this little pamphlet distinguished by the clear purity of its style and the appropriate discussion of its arguments, our author has combined and concentrated a great mass of evidence tending to prove our unity the utility but the absolute necessity of Houses of Recovery of the great metropolis of the Kingdom. Those choropleys who are about to propose or undertake such laudable and humane measures had better peruse themselves of the pamphlet, and turn to their advantage the advantages of our author.²⁶

Dickson's last publications while at Clifton was, interestingly enough, the case of one of his own children. By now the family had grown to the addition of Mary Emily,²⁷ Anne Rose Maria,²⁸ and his only

son, George David Williams.²⁴ The patient was ten year old Peter who had been ill for more than a month but who had made a rapid recovery when ginger was tried.²⁵

The last and longest stage of Dartton's career was his appointment on February 20 1824 as Physician at the Royal Naval Hospital at Haslemere usually referred to as naval records as simply Plymouth Hospital. Here he remained until his retirement in 1847. Plymouth Hospital was purpose built and had been opened in 1762. It was designated as one of the most advanced hospitals in the design. A guide book at 1830 described it as Dartton must have seen it.

The site of the Hospital is on a pleasant sunny from the water of Bournemouth creek.

The area of the whole is about twenty-four acres more than half of which is laid out in a variety of law surrounding the building. An avenue from Peter Street leads to the officers' buildings and opposite to them is the entrance to the Hospital with the commissioners' and other officers adjoining. The Hospital consists of six buildings each containing six wards every one of which is subdivided in seven or sixteen patients. Great care is taken to prevent contagion. Between the principal edifices are four pavilions occupied as storerooms operating room small parl. ward smoking and visiting rooms. The smaller building in the department over this is a chapel. Near to the water-side on the left and distant hardly with every passage such boats and dykes passed are anchored. At the eastern angle of the entrance which supplies the whole establishment with water and is a little distance from the building is a field used as a cemetery.²⁶

The Hospital was governed by an officer holding the rank of a post captain on the Navy, who also discharged the duty of medical commissioner at the port of Plymouth and lived in the Hospital. The Physician also was provided with a

residence in the Hospital.

It was to this establishment that Dr. Dartton reported on February 25 1824 to present his 'Warrent of appointment to Governor Dwyer' — and immediately took five weeks leave²⁷ before taking up his new duties which appear to have been marine. In May he applied for permission to take two pupils to assist him quoting as precedent that the Surgeon had such authority but the request was refused.²⁸ A new long policy to discourage this form of medical education. However other forms of medical education were being strongly encouraged and in addition to his normal duties (but without extra pay) every visit Dartton was obliged to give medical lectures throughout from April to July to the medical staff of the Hospital and of each ship as well as port. On March 11 1829 Dartton writes²⁹ that he has been in port for five years and has not had one day or night's absence. In order to be in a position to take leave when his health is failing, he reports permission to having weekly medical or fortnightly so that the lectures could end on May instead of July, and change the time to 2 p.m. instead of 1 p.m. as there was a difficulty of attendance because of departure hours ships mentioned etc. The Commissioners for Ventilation raised no objection.

As a part of the campaign to improve medical education, concerned particularly with Sir William Hunter's appointment as Physician General of the Navy it was decided to establish medical libraries at Haslemere and Plymouth Hospitals. The Haslemere library began in 1817 but there were delays at Plymouth because of accommodation difficulties. Eventually the nucleus of Plymouth Library was established in 1822 and Dr. Dartton was instrumental in setting up the library and developing it over the next fifteen years. It was the Physician's duty to improve the Library and the Surgeon's duty to supervise

the Museum, although they worked closely on these projects. It appears to have been mainly Dickson who drew upon his wide knowledge of the medical literature, recommending titles to be purchased for the basic stock and the several cabinets. He gave some of his own books to help establish the Library²² and must have spent much time and thought on its organisation and administration. The evidence suggests that he set a high standard, which declined after his retirement. Probably this aspect of his work was recognised by the scholarly tastes of the younger old bookman, as he was named by a new medical Assistant Surgeon, Edward H. Cope, in 1857. Cope kept a journal, and gave us an evocative personal glimpse of Sir David.

How did I received my appointment from the Admiralty as Assistant Surgeon a few days before the arrival of Queen Victoria. I was appointed as additional Assistant Surgeon in HMS Royal Albion, flagship at Devonport. On passing her I was ordered to do duty at the Naval Hospital, Devonport where I was under the Physician Sir David Dickson. All the Assistant Surgeons met at together and got on very well together. Our duties were not arduous at 11.30 a.m. to attend the Physicians round his wards afterwards to the Dispensary to wait in making up medicines and the Apothecary. Generally working away all the morning and in 3 p.m. which I used often half an hour. Sir David had shown evidently that he and was somewhat a little thick in his speech and very crabbed, and I have seen him just for the pain of the leg of an eagle had which had been put up against the wall, much to the apparent mind of the ward and Assistant Surgeons, but he was a clever old bookman. One Wednesday afternoon we had a very much rather a medical or surgical clinical lecture from the Physician or Surgeon.²³

In 1821 and 1834 two new hospitals were

built, one national²⁴ were transferred upon Dr Dickson Plymouth. His other reports had a history of epidemics, but the cholera epidemic of 1832 was particularly severe with no fewer than 1786 cases and 696 deaths. The medical profession at Plymouth had responded so successfully to the relief of the afflicted face as the Town during the late destructive visit of the malignant cholera²⁵ that the Mayor and Community of the Borough of Plymouth gave its members the Freedom of the Borough. Dr Dickson was one of the doctors listed all brought recorded as "James Dickson Surgeon in the Royal Navy."²⁶ In 1831 he married a gentle beauty, although belatedly "for his services in the West Indies."²⁷ On August 20 he was created a Knight Bachelor by William IV as Sir James Falcon.²⁸ The year 1834 was also marked by a sad event, the death of his daughter Agnes.²⁹

After his appointment to Plymouth Hospital in 1834 Sir David appears to have published very little. Perhaps this was because the career successes of his early years had vanished, but he was at the top of his profession. Perhaps his duties kept him too busy. Certainly the Library must have taken up a lot of his spare time over the years. Nevertheless he worked a few interesting cases at Plymouth Hospital to the medical press, including cases of aneurysm³⁰ phthisis³¹ aneurysm³² a fatal wound and other cases.³³⁻³⁵ In 1840 he acquired his LRCP (Edin) and on August 23 of the same year became Inspector of Hospitals at Plymouth, but 1840 had also seen his seventh birthday, and it seems that Sir David's health was beginning to fail. In 1842 he was struck through illness when the annual inspection of Plymouth Hospital took place.³⁶

On July 27 1847 Sir David Dickson retired after more than twenty three years' service at Plymouth Hospital. He and his family had to give up the Physician's

residence in the Hospital and settled in a rented house at 13 Lower Darnford Street, Birmingham only a short distance away. Birmingham had become a hideous place at that time and Sir David had obviously put down roots during his long stay in the city. His brothers and sisters had died, and there did not appear to have been any close family ties to attract him to his birthplace. He did not live long to enjoy his retirement; for he died at home on January 2 1883 after having been for a considerable period in delicate health.¹ The Refs. Med. remembered him as 'our distinguished mathematician', but surviving son of the late Rev. George Jackson, Master of Balliol.² Most of his connections were very local.

Sir David's Will was quite simple, providing a competence for his wife and children from insurance, government bonds, and investments. To his wife he also left the household furniture and plate, but no other effects were specified. However, it is possible that a few more of his medical books might now have found their way to the Medical Library at Plymouth Hospital.³

And so for over one hundred years the name of Sir David Dexter seems to have passed into obscurity despite his long and active life of constructive service, until that handful of books bearing the signature D. Dexter in the Medical Library at Plymouth Hospital suggested a specific interest about the man who had owned them.

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2. Memo W. comp. *Ref. J. the Royal College of Physicians*, *Index Librorum* (The College, 1875), 224a.
3. *Refers* 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.
2. *Refers* 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.
3. All dates of Dexter's recent appointments have been quoted from the official records kept at the Public Record Office, ADM 1148724, ADM 1148725, ADM 1148726, ADM 1148727, ADM 1148728, ADM 1148729, ADM 1148730, ADM 1148731, ADM 1148732, ADM 1148733, ADM 1148734, ADM 1148735, ADM 1148736, ADM 1148737, ADM 1148738, ADM 1148739, ADM 1148740, ADM 1148741, ADM 1148742, ADM 1148743, ADM 1148744, ADM 1148745, ADM 1148746, ADM 1148747, ADM 1148748, ADM 1148749, ADM 1148750, ADM 1148751, ADM 1148752, ADM 1148753, ADM 1148754, ADM 1148755, ADM 1148756, ADM 1148757, ADM 1148758, ADM 1148759, ADM 1148760, ADM 1148761, ADM 1148762, ADM 1148763, ADM 1148764, ADM 1148765, ADM 1148766, ADM 1148767, ADM 1148768, ADM 1148769, ADM 1148770, ADM 1148771, ADM 1148772, ADM 1148773, ADM 1148774, ADM 1148775, ADM 1148776, ADM 1148777, ADM 1148778, ADM 1148779, ADM 1148780, ADM 1148781, ADM 1148782, ADM 1148783, ADM 1148784, ADM 1148785, ADM 1148786, ADM 1148787, ADM 1148788, ADM 1148789, ADM 1148790, ADM 1148791, ADM 1148792, ADM 1148793, ADM 1148794, ADM 1148795, ADM 1148796, ADM 1148797, ADM 1148798, ADM 1148799, ADM 1148800, ADM 1148801, ADM 1148802, ADM 1148803, ADM 1148804, ADM 1148805, ADM 1148806, ADM 1148807, ADM 1148808, ADM 1148809, ADM 1148810, ADM 1148811, ADM 1148812, ADM 1148813, ADM 1148814, ADM 1148815, ADM 1148816, ADM 1148817, ADM 1148818, ADM 1148819, ADM 1148820, ADM 1148821, ADM 1148822, ADM 1148823, ADM 1148824, ADM 1148825, ADM 1148826, ADM 1148827, ADM 1148828, ADM 1148829, ADM 1148830, ADM 1148831, ADM 1148832, ADM 1148833, ADM 1148834, ADM 1148835, ADM 1148836, ADM 1148837, ADM 1148838, ADM 1148839, ADM 1148840, ADM 1148841, ADM 1148842, ADM 1148843, ADM 1148844, ADM 1148845, ADM 1148846, ADM 1148847, ADM 1148848, ADM 1148849, ADM 1148850, ADM 1148851, ADM 1148852, ADM 1148853, ADM 1148854, ADM 1148855, ADM 1148856, ADM 1148857, ADM 1148858, ADM 1148859, ADM 1148860, ADM 1148861, ADM 1148862, ADM 1148863, ADM 1148864, ADM 1148865, ADM 1148866, ADM 1148867, ADM 1148868, ADM 1148869, ADM 1148870, ADM 1148871, ADM 1148872, ADM 1148873, ADM 1148874, ADM 1148875, ADM 1148876, ADM 1148877, ADM 1148878, ADM 1148879, ADM 1148880, ADM 1148881, ADM 1148882, ADM 1148883, ADM 1148884, ADM 1148885, ADM 1148886, ADM 1148887, ADM 1148888, ADM 1148889, ADM 1148890, ADM 1148891, ADM 1148892, ADM 1148893, ADM 1148894, ADM 1148895, ADM 1148896, ADM 1148897, ADM 1148898, ADM 1148899, ADM 1148900, ADM 1148901, ADM 1148902, ADM 1148903, ADM 1148904, ADM 1148905, ADM 1148906, ADM 1148907, ADM 1148908, ADM 1148909, ADM 114891





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Surgeon Lieutenant J. H. L. Laidlaw



Surgeon Lieutenant J. L. Laidlaw

SHORT QUALIFICATIONS

Surgeon Commander E. H. Shaw — FRCS

Surgeon Lieutenant Commander F. H. Shaw — FRCS

Surgeon Lieutenant Commander A. H. Shaw — FRCS

Surgeon Lieutenant Commander F. C. Shaw — FRCS

Surgeon Lieutenant Commander M. Shaw — FRCS

ROLL OF HONOURS BY THE ROYAL MEDICAL ASSOCIATION

Surgeon Commander D. E. Wright has been elected to the Roll of Honours of the RMA. The official presentation of the scroll took place at the Association's dinner and AGM at Brighton on July 1.

PROCEEDINGS

To Surgeon Lieutenant Commander

F. H. Shaw — E. H. Shaw

To Surgeon Lieutenant Commander E. H. Shaw

E. H. Shaw — F. H. Shaw — F. C. Shaw — M. Shaw

To Surgeon Lieutenant

F. C. Shaw

To Surgeon Lieutenant E. H. Shaw

E. H. Shaw

To Acting Surgeon Lieutenant

M. Shaw

Presented with stars by permission to the Surgeon E. H. Shaw

To Surgeon Captain

E. H. Shaw — F. H. Shaw — M. Shaw — F. C. Shaw

To Surgeon Lieutenant

M. Shaw — F. H. Shaw — F. C. Shaw — E. H. Shaw

To Surgeon Lieutenant (E)

E. H. Shaw

ROYAL NAVAL RESERVE

PROMOIONS

To Surgeon-General
 21st Dec 1914

To Surgeon-Commander
 21st Dec 1914

To Surgeon-Commander
 21st Dec 1914

RETIREMENTS

Surgeon-General P. A. Wood RD

Surgeon-Commander A. E. Brown RD

PROMOIONS

To Surgeon-General
 21st Dec 1914

To Surgeon-Commander
 21st Dec 1914

APPOINTMENTS

To Principal Surgeon (Royal Hospital) 21st Dec 1914

21st Dec 1914

To Surgeon-Commander 21st Dec 1914

21st Dec 1914

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

QUEEN'S NURSING SERVICE

Surgeon-General P. A. Wood RD

Surgeon-Commander A. E. Brown RD

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FOURTH SYMPOSIUM OF NAVAL MEDICINE

Editorial

During the last year, we have produced several gatherings in the format of Naval Medicine have taken most of the time, read in these columns during recent years one stage further.

In early June following the Official Opening of the 1964 redevelopment, the Fourth Symposium of Naval Medicine was held on the theme "Operational Medicine". The main sessions, "Medical Support in the Operational Role", "Future Support at Home and Abroad" and "Scientific Support for Operational Needs" approached quite closely the functional tasks of our Flag Structure. To some extent, symposia of this type are a stocktaking exercise: they look back at what has been achieved and forward to what should now be done. The Symposium, like its predecessors, underlined the complexity of the modern naval medical task in terms of its breadth and variety. It demonstrated, in addition, the sophisticated equipment of the really very small Branch provided to fulfil these tasks. We have gained considerable depth of expertise in a number of areas, many of them unique to our units, spread across the clinical preventive and research areas of medicine. Perhaps inevitably with the political constraints on our numbers as well as the professional training requirements imposed on us from outside the Service, although this reputation is deep, numbers are spread very thinly. The necessary support, both of movement of a single medical officer on such progress across a wide field of activity. In many of the smaller operations

we support we provide a concentration area (training, transport) and so are forced to depend on local training for replacement against a loss rate that is frequently impossible to predict.

In this and the Spring 1963 issues of the Journal we are publishing the proceedings of the Fourth Symposium as a selection of papers, short reports and summaries. A glance at these contents illustrates the breadth of subject to be covered.

At the end of July the first of the planned series of Royal Navy/United States Navy Joint Workshops on Combat Casualty Care which were announced in these columns a year ago¹ was concerned with the treatment and disposal of mass casualties in the conventional war scenario. One paper of particular general interest from that Workshop is also published in this issue.² As the first Workshop of a planned series of five this was designed to provide the template on which subsequently to superimpose additional threats posed by chemical, thermal, nuclear, biological and nuclear conditions. The second Workshop is planned for early 1965.

More and more words, the tempo may observe "but what about action?" The support must and will involve every one of us, however far removed from the operational scene we may be on day-to-day activity, our political masters and the operational commanders must remain our reason *d'être*, but this action must be provided by medical planning and organisation, and this in turn depends to a large degree on some aspect

most of all, it is a mistake to think that the value of both these provisions would be nullified in a large sense on the basis of a sentence through the years of relative importance waxes and wanes perhaps the dangerous idea have merely given us a necessary proof.

It is tempting, with protection for the future, clearly and consistent in the light of its, tactical assessment on June 25 concerning changes in the shape of the Defense Force, its provisions and small distribution but prearrangement in the field of law.² We must be ready with the

assessment and the plan. That both may have to be modified in the light of our conditions providing does not mean that effect has been wasted merely that the total result will have been more thoroughly considered.

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Care of Service Children on the Gaspot Peninsula

Surgeon-Member of Command C. E. Keston MA MB BChd MRCP DGB RN and
Surgeon-Commander E. H. Vincent MB BS MRCS LRCP MRCP DGB RN

Summary

As the result of recent developments which have made it possible to reduce or alter depth of hospitalization and therefore alter the nature of the experience, it is possible for the care of these children to shift from a total and continuous one, but which meets the basic long-term needs of the child, to a short-term one, which fulfils the Gaspot problem. In the problems have been more clearly defined, as it has emerged and been put in the context of the child's life. It is now possible to compare the hospital experience with that of the child's life, and to see that the child's life is not a total and continuous one, but that it is a series of experiences. It is possible to give a more realistic picture of the child's life, and to see that the child's life is not a total and continuous one, but that it is a series of experiences. It is possible to give a more realistic picture of the child's life, and to see that the child's life is not a total and continuous one, but that it is a series of experiences.

Introduction

The complex social changes which have affected this country in the post-war era have been reflected in the family structure of naval personnel and in their lifestyle. The Ministry of Defence policy to provide a married quarter wherever required coupled with the rapid housing programmes of the 1950s created new densely populated communities in areas surrounding the larger naval establishments. The married quarters, which at Rosport Gaspot exemplify the change. In 1950 there were only 58 houses at Rosport and married quarters now comprise more than 3,000 of the 10,000 houses existing in the area (Fig. 1).

The effects of growing up in such a dense community have been observed by several groups.¹⁻³ These persons have recorded observations such as the wife of a naval rating whose two-year-old daughter



Fig. 1. Rosport Gaspot, 1950-1960.

experienced a behavioural upset soon after the father went to sea. She wakes up every night for three weeks, screaming and wailing out 'No, no, Daddy go away'. However, recent studies have added further objective information regarding the health and development of children from naval families on the Gaspot peninsula in the reports submitted in evidence to the Naval Welfare Committee.⁴

This paper includes an account of the problems experienced by both the families concerned and the naval authorities. As yet there is little information about the special problems experienced with handicapped children. Personal experience suggests that there and the "under-fives" may be the most severely disadvantaged of the present time.

The social factors which are considered to contribute, singly or in combination, to the extent of these problems within the Service are reviewed. Consideration has also been given to ways in which these problems might

be approached on a wider or more of preventive action being taken by the Royal Naval Medical Service to help both the children and the service.

Child Behaviour and Development

A psychiatric assessment of the emotional difficulties encountered in children from naval families was reported in 1971.¹⁴ This contained an analysis of data from interview studies in which 75 naval children were compared to civilian controls. It was found that 'clinging behaviour' of young naval children was more pronounced during the absence of the father and that naval children of primary school age (5-12 years) were often reluctant to let behaviour problems which are known to be associated with separation from the father. These included withdrawal and depression in the child, attention seeking, disobedience, moody and a tendency to increased aggression and destructiveness. Low able children (IQ below 80) showed significant adverse effects from the increased number of school changes. This research also showed that the mothers in naval families were significantly more depressed than civilian controls and the depression was worse during the father's absence. Corvus reports indicate that these effects are magnified dramatically by a number of life stress events in particular pregnancy, recent loss of a child or parental knowledge that a handicapping condition has been diagnosed.

The high incidence of depression in many mothers of children under five years became apparent from a number of studies of civilian populations conducted in the 1970s.¹⁵ These illustrated the effects of maternal depression on a child, which include developmental delay, behaviour problems such as anxiety and eating and an increased incidence of nocturnal enuresis and parasomnia in the home.

Longitudinal studies on separation and

family disruption in early life have shown a marked association with delinquency by 21 years, psychiatric illness, divorce or separation and the leaving of educational children by 26 years. An increased incidence of certain illnesses such as migraine and rheumatism have also been described but no longitudinal data is available for children specifically from naval families.¹⁶ Marital breakdown may also have lasting effects on child development but again little data is available regarding its incidence in naval families.

Despite the arrangements made by the Ministry of Defence through the Services Children's Education Authority, many difficulties still face a service family with a handicapped child. The father may feel a conflict between his duty to the Navy and the needs of his child and as a result a handicapped man, he considered for reasons we cannot go into being inhibited with a 'wellness pack' which they believe may compromise drinking and subsequent chances of promotion.

The pattern of referrals to the Naval Psychiatry Unit at RMH Haslar suggests that these problems still occur and represent a considerable burden to both the family and the community.

Child Nurture

Current concepts of child abuse encompass a variety of different forms of sexual, physical, neglect, discipline and emotional deprivation.¹⁷ A study of 60 consecutive admissions to the Paediatric Unit, RMH Haslar from 76 families referred for consultation between January 1977 and June 1979 attempted to identify areas in which both parents and children could be helped by social and medical authorities.¹⁸ The study showed that social isolation, geographical isolation from close relatives, unplanned pregnancy with major complications and a poor academic

background in young patients were common factors in the families. A tendency for fathers to abuse alcohol and for mothers to be dependent on psychotropic drugs was noted. Few of the mothers had breast fed their infants. (The geographical clustering of families in this study is shown in Figure 2). The risk to children in rural families (Guyana General Social Class III) is thought to be comparable with the risk in Social Class V urban families.

Although severe families are generally considered a risk of child malnutrition the conclusion that the occupation of the father makes minimal contribution to a review of 428 cases of child abuse and neglect in the American Navy and Marine Corps, the characteristics of the families and the nature of the incidents were not considered appreciably different from those reported in the urban community.¹⁰ Nevertheless recognition of the problem in the United States resulted in far reaching changes in policy in 1975. A Terrence Child Advocacy Working Group was established and a Rural Child Advocacy Programme was started in February 4, 1976.

Between 10 and 20 years of suspected

child malnutrition in rural families are referred to the Children's Unit at ENH. Historically, frank physical injury caused by a parent may now be less common than a "wet nose" (child beating) in which the mother slaps post "bawling" behaviour and is more inclined to shake or roughly handle her child. The infant may seldom persistently exhibit sleep and feeding difficulties and "fail to thrive". Behaviour difficulties and language delay may be observed subsequently, contributing to a picture of chronic emotional deprivation.

Child Deaths

A confidential enquiry into infant deaths in the Guyana peninsula (1977-84) has recently been undertaken.¹¹ A yet death in the unexplained death of an infant usually between the age of two and four months is a the most common cause of death in this (spontaneous) age group. Although the actual causes of such deaths are still poorly understood, a number of factors are known to be associated with an increased risk. Protective nursing systems have been developed which enable this to be calculated and certain infants may be



Fig. 2 Geographic distribution of Child malnutrition cases by Clinicals.

identified in whom the risk of cot death during an episode of acute illness is as high as one in fifty.¹⁴

Between January 1977 and June 1980 there were 25 cot deaths on the Gosport peninsula. 12 of these were in naval families. The geographical incidence is shown in Figure 1; comparison being made with the selected child abuse cases referred to RNMH Minder from January 1977 to June 1979. Clustering of cases occurs in the Gosport estate and some overlap between the two incidences is evident.

This clustering was confirmed by a discriminant technique used to analyse possible risk factors in 27 families where a cot death had occurred and compared retrospectively with 24 matched controls. Amongst the many significant adverse factors were the following: the actual choice of beds rather than breast feeding as address in the Gosport estate and poor maternal competence as assessed by the health visitor. The fact that the father was employed by the Navy did not appear to confer any additional risk.

The incidence of cot death (7 per 1,000 live births) in the naval and civilian populations in Gosport is above the national estimate of 2.2 per 1,000 live births. Cot death causes great distress; the family may need extended support including extended psychiatric care of subsequent children. The knowledge that there is an increased risk will deter the primary care team in providing support to a family although cot is likely to need the using a parent extensively.

Accidents and Poisoning

Each year 3,000-4,000 children who are accidentally injured are brought to the Accident and Emergency Departments at RNMH Minder. The majority of these injuries occur in and around the home. Certain phases of the development of the Gosport estate have been played by maintenance

problems: window sashes on the seventh floor of the high rise 'Morris' have been vandalised or become worn and other environmental hazards for children exist. About 40 children were referred to RNMH Minder in 1980 with chemical injuries of whom 12 received harm from ingested items in naval married quarters. A fireguard is a legal requirement where there are young children and these are now supplied for family quarters when required. Soft play areas are essential and perimeter work needs to be undertaken not only for individual families but for the community as a whole.

Between 20 and 30 children a year who have medical indications prescribed for their parents are admitted to RNMH Minder. Those who have physical developmental lagging or intellectual inflexibility represent a particular concern.

Failure to Utilise Perinatal Services

Only 40% of naval families from Gosport utilise the services offered by the health visitors, who are responsible for monitoring all children for developmental abnormalities compared to 90% of families from an adjacent predominantly residential area. In our experience the considerable delay in diagnosis and treatment has placed a further burden on the child who is handicapped. However, attendance at the well baby clinics and immunisation sessions at Gosport is good. Figures for the latter ranging from 82.5-97.6% over the years 1972-1979. These figures are well above those for the Portsmouth district as a whole.

Problems for the Service

A naval general practitioner practice has staffed naval families in which the father was granted compensation to leave to return home from his place of duty outside the Portsmouth area.¹⁵ In one year alone this was necessary in 44 families registered with a small Gosport group practice. Twelve of

21 of these families were available in 19 (89%) the reason given for missing comparisons here was the inability of the mother to cope with the children. 11 of the ratings were 'worry on surface ships and two were 'worry in port' otherwise. The sudden removal of skilled personnel for such brief bursts heavily on Fleet efficiency. The problems caused by these problems has a demoralising effect on the Servicemen himself and this was acknowledged in the report of Admiral Troup's Committee of Enquiry into the re-employment of skilled men in the Royal Navy he stated: 'We should recognise the overriding influence that a wife has on a sailor's decision to stay in the Royal Navy and we must also realise which demonstrates a confusing contrast in and between the civil wife and children'.¹⁴ Naval medical officers have a unique opportunity to identify and to prevent some of these problems.

The Social Variables of this the Service

Physical child malnutrition and jet delays are two important indicators which represent the "tip of an iceberg" of social and environmental disadvantage. Figure 3 illustrates the other problems which tend to be associated. There are commonly noted in communities in underprivileged inner city areas where low levels of parenting skills and inadequate provision of preventive child care services may also be found. On

epidemiological and social grounds such the same group of children appears to be at high risk of both child malnutrition and jet delays.¹⁵ The geographical clustering of problems in Bowyer and in at least two other areas, demonstrates obvious disadvantages and inequality recently highlighted in the Black Report.¹⁶

In the 1960s and 1970s the average age on marriage dropped to the lowest recorded since post-World War II in 1955. The presence of a fully equipped naval married quarters is likely to have facilitated marriage for young naval ratings. Adjustment to the marriage and to the conflicting interests of the Service creates a less than ideal domestic environment in which to start a family. The educational and social background of many young ratings has placed them at a disadvantage in receiving family care. In the child above study referred to earlier 49% of naval fathers had obtained no GCE or CSE qualifications, 40% had experienced family disruption and a similar proportion had had some contact with the police. In some areas the type of housing, which includes flats and high rise buildings, is that known to be associated with a low community morale.¹⁷

Two other factors, mobility of the father and his absence from the home, were noted in the Sobush report to 'run like a thread' through the difficulties experienced by naval families. Over 30% of the naval families in the Gasport area move each year. The recommended maximum length of temporary separation of naval ratings from their home has now been reduced to six months. Also wife's incomes have not generally been comparable to those of nonmilitary civilian communities. The community officers and Welfare Wives have had numerous "lost hat" tales about on them, but they have often lacked the professional support necessary to enable them to deal effectively with more complex family problems.

FIGURE 3. THE TIP OF THE ICEBERG



Fig. 3

The Growth of Family and Child Care Services

Professional guidance for naval families in the Gosport area has evolved gradually. A health centre was employed and play groups set up especially for naval children on the former estate in 1969. A community officer at HMS Witley CPD and access visitors were employed on site. With the constant need to re-emerge it was a logical step to share the available facilities with civilian agencies and in 1973 the naval health centre became attached specifically to one general practice: the new home part of the team of 30 civilian health visitors responsible for preventative work in Gosport. This health visitor is increasingly seen as the key person in the direction of children who have special needs at home, particularly where there is close communication with the hospital-based services. The number of potential practitioners and members of the community health team has also gradually increased since the 1960s. In 1977 the Naval Welfare leaving the Naval Personnel and Family Service. There are now up to 30 part time and four full time personnel working in the six naval playgrounds and community and recreation centres.

Although children were accepted as dependants and resided at HMS Madley from the early 1940s it was not until 1974 that a paediatrician was employed. Physically handicapped children on the Gosport peninsula benefited from the services of a naval physiotherapist until he left the Service this year. A special effort will be needed to maintain this work in the future.¹¹

In the late 1960s the Senior Community Medical Officer for Gosport submitted a proposal to the Hampshire County Council for the provision of an independent nursery for under fives with handicap or developmental delay. These plans were shelved in 1974 due to lack of finance.

Prior to 1973 provision for handicapped children in Gosport included a civilian General Medical Officer who also helped with children who had behaviour problems. Unfortunately she was allocated premises which proved unsuitable: access to a clinic room in a small classroom was blocked by four barrels stored for the Harbour Community Centre but! Ironically, the post was withdrawn by the Community Health Department at a time when naval children were being recognized to be at increased risk.

An opportunity group (a special group for handicapped children and their parents) was established but this had to function with limited resources and professional support.

Specialist services have in the past needed to function in isolation. In many cases this has resulted in conflicting advice and ineffective communications leading to a lack of a clear programme and planned review. These now there are very few places for handicapped children under five within the military system.

Conclusions and the Way Ahead

It is clear that factors related to Service life have imposed a particular burden on young families. This situation causes many complications regarding family planning for Service personnel. It is not known in what extent family planning is affecting the incidence of some of the problems reviewed. However in order to reduce the serious problems of child maltreatment it has been recommended that the Naval Medical Service must have closer contact with the married quarters community where preventive work must be done.¹² Support aimed at strengthening families and the lack of the married family capable of immediate response is a concern has also been recommended by the NSPCC and Social Services Handicapped Units. A number of imaginative schemes

have recently been developed in the USA.^{18,19}

Still at the Children's Unit, RNH Harar, one obvious family crisis of the "near miss" type described above by co-ordinating care, providing the mother with temporary relief from a caretaker role, and one also potent unnecessary requests for compassionate release through effective communication with the father or son.

A team co-ordinating resources for handicapped children along the lines recommended by the Coen Committee was established in Gaspard in 1980 and includes representatives from the Navy.²⁰ The work of Blackith and others has clearly demonstrated the advantage of co-ordinators serving the handicapped children and a Harar Children's Bureau booklet describes the way that this has been achieved through multi-agency co-operation in the setting up of child development units.^{21,22} More than 70 of these units have already been established in this country and many are also able to provide some degree of family support to the local community. It is the authors' view that this is the most appropriate and acceptable way of forming this support in Harar. Careful planning is required to avoid labelling a family whilst seeking those to greatest need and attempting to encourage will help. A team involving several disciplines is being set up to work with the primary care health workers and general practitioners to help rural families (Fig. 4).



Fig. 4. Integrated child care team in each province and district.

The Naval Medical Service has recently taken an initiative in forming a Naval Child Care Group in the Gaspard area (estimated naval child population 10 000 of a total 25 000 children). A Child Care Centre has been established in Harar to provide in the centre of the married quarters estate (Fig. 5 & 6). The centre opened for limited services in August of this year on a tight budget.²³ Thanks to the assistance of volunteer naval wives, such child care



Fig. 5. A Naval Child Care Centre in Harar, Kordofan & Nyanza, serving the naval dependants of the garrison.



Fig. 6. A Harar Child Care Centre, Kordofan & Nyanza, serving the children and their mothers of the garrison.

qualifications and with money raised from such charities, it is now possible to offer therapeutic, support and behaviour group facilities for children at risk.²² The work involves a high ratio of experienced nursery staff and for a moment in the long term funding already applied for from the Hampshire Area Health Authority and additional funds donated from charities are likely to be needed. A mother support group, originally set up in 1979 by a cerebral palsy clinic is one of a number of resources allocated to the service.

Future improvements in the health of children may depend as much on the beliefs and behaviour of parents as on the services provided. Child development units have made a significant contribution in many local communities. It is hoped that by focusing on the care and development of handicapped and disadvantaged children as a unit of this type in support, social parents may be encouraged to help each other and maximize adverse effects of service use. By bridging a gap between the Royal Navy and its families a further aim will be to increase the motivation and effectiveness of many servicemen in the future.

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Transfer Users in the Global Space

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Many self-reported drug usage problems in the United States are more than 20 years old. Among the most widely reported problems are problems with alcoholism, which is an ongoing problem for many and chronic drug use, which is a problem for many. The problem of alcoholism is a chronic problem for many, and the problem of chronic drug use is a chronic problem for many. The problem of alcoholism is a chronic problem for many, and the problem of chronic drug use is a chronic problem for many.

The trend of these changes has been a reduction in regional differences for the American states in the north of the U.S. and has been a reduction in the north-south divide in the American continent. The American states in the north of the U.S. have been the most developed and the most industrialized. The American states in the south of the U.S. have been the least developed and the least industrialized. The American states in the north of the U.S. have been the most developed and the most industrialized. The American states in the south of the U.S. have been the least developed and the least industrialized.

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The bludge of the novel contains two underlinely intertwined in a variety of characters and people above a no exception. The sociological influence of the author's life on people whose influence in the Royal Navy has been ultimately reviewed by Ward who considered personality of major impact. These dietary factors including both the content and regularity of meals were also thought to be a problem. Altered consumption and smoking are both common to him amongst sailors and probably result from and contribute to group behavior patterns, which document circumstances include separation which may impact a consequent financial stress, especially on young sailors soon after entry. Latest findings may also emphasize behavioral and environmental hazards and the development of new techniques.

map for selected for physical fitness

Paper, which has in the past been responsible for a considerable loss of time from work in the United Kingdom between 1934 and 1975 almost four million working days were attributed to paper, when disease of an estimated loss, in the quantity of over 14 million.¹² Although the exact figures for lost time from work in the Board Mary are not known, it is probably that the mill has been at least considerably

A particular interest in genetic studies during the Royal Navy was stimulated by the work of Lord' during World War II. He noted that one-third of all casualties from the Royal Navy were due to a diagnosis of genetic blood disease and at that time special diet courses and transfusion services were set up throughout the United Kingdom in an attempt to conserve manpower. While working with the Army at that time, for Arthur Hearn believed that an extensive screening of manpower for both the Army and civilian sectors would result from the establishment of special units to diagnose and manage preclinical genetic problems. Despite being recommended during the 1940s such units have only developed in the Royal Navy during the past 15 years becoming firmly established at the Royal Naval Hospital, Haslemere under senior com-

During the period 1960-1980 the mean degree of pupal adjustment in the May has been observed to be almost twice that in the northern population¹ with a slight increase in incidence occurring between 1970 and 1980 at this time environmental stresses

was by the single contrast barium meal therapy initiated day after and often a milk drip and patients frequently spent prolonged periods in medical category F18. Approximately 50 patients a year were operated on for peptic ulcer at RNM Hospital since and almost 50 patients were hospitalized annually with this condition.

Diagnosis

In the last decade dramatic changes in the diagnosis and management of duodenal ulcer have occurred and the Royal Navy has been in the forefront of many of these advances.^{1,2} The development of fiberoptic has provided us with gastrointestinal endoscopes which have immensely improved our diagnostic accuracy. The early interest of a gastrointestinal endoscopy service at RNM Hospital (under Zimelmann and Gibbard) has provided a facility which was made both rapid and accurate diagnosis in the dyspeptic patient.³

Since 1970 the number of barium meals performed at RNM Hospital has fallen from a peak of 888 in 1971 to 402 in 1980 while diagnostic upper gastrointestinal endoscopies have increased from 188 in 1973 to 806 in 1980 (Fig. 1). The common diagnoses which are made in the dyspeptic patient are shown in Figure 2. Although duodenal ulcer remains the most common problem, gastric ulcer and particularly oesophagitis, have both increasingly diagnosed.

Treatment

Since 1972 interest in peptic ulcer disease in the Royal Navy has extended beyond that related to epidemiology and diagnosis and considerable research has been carried out with newer therapies to agents as an attempt to reduce the color book of his job and reduce the service.

Our concepts of the pathophysiology of peptic ulcer have changed little since the publication of Ha and co-workers' study by Schwartz in 1914⁴ which emphasized



Fig. 1 The number of upper gastrointestinal endoscopies at RNM Hospital during duodenal ulcer diagnosis increasing at 1.7% per endoscopy.



Fig. 2 Diagnosis made at upper gastrointestinal endoscopies at RNM Hospital 1973-1980 which show the increase in diagnosis of gastric ulcer and oesophagitis.

our continuing belief that the primary problem is associated with hyperacidity. The revolutionary work of Black and his colleagues⁵ who defined the presence and antagonism of the histamine H_2 receptor and its importance to gastric secretion, has subsequently led to the development of the H_2 receptor antagonists and the world wide use of cimetidine.⁶

Work at RNM Hospital has been important in the development of cimetidine resistance and subsequent similar drugs which are still under production.⁷ Using the food stimulated acid secretion technique of Fordtran and Wink⁸ allowed us in our early studies to determine the optimum timing of a dose of cimetidine. When given with a meal the drug produced an inhibitory blood concentration which maintained a

plasma and controlled gastric acid output through the meal digestion period when the buffering effect of food disappears. When given half an hour before the meal peak serum levels of cimetidine were much higher but serum levels were not maintained to cover the meal-digestion period.¹² The development of a technique for monitoring 24 hour urinary acidity permitted us to establish in outpatient clinic regimes of cimetidine 300mg tid and 400mg noct.¹³ Since that time for a variety of reasons we have treated 56 patients with duodenal ulcer while taking the standard dose of cimetidine (160/day). The effect of treatment in this large population of duodenal ulcer patients can be seen in figure 2. Cimetidine effectively reduced nocturnal pH from a mean of 1.41 to a mean of 1.73.¹⁴ Data from controlled studies of cimetidine used therapeutically for duodenal ulcer show that in 18 studies involving 1065 duodenal ulcer patients cimetidine 0.6 to 1.8G per day gave a healing rate of 77% compared with 45% on placebo.¹⁵ The majority of patients heal their ulcer with the treatment and those who do not frequently heal if the dose is increased and the treatment period is prolonged.¹⁶

At the present time we are particularly interested in those patients who fail to respond to cimetidine during the overnight period¹⁷ and examples of patients from each of these groups is shown in figure 3a and b. Extensive research is currently progressing in this area with a view to identifying better those patients who will benefit from surgery.

Ranitidine is a new H₂ receptor antagonist with its structure based on a furan ring as compared to the imidazole ring of cimetidine. We have evaluated ranitidine and shown it to be an effective H₂ receptor antagonist in duodenal ulcer patients and with slightly greater potency in a dose of 150mg bid compared to cimetidine 200mg



Fig. 1 The pattern of 24 hour urinary acidity in 56 patients with duodenal ulcer (160). The pH decreases markedly throughout and with a peak at 18 hours. The timing of meals is shown by the horizontal line indicating sleep and wakefulness.



Fig. 2 The pattern of 24 h urinary acidity in 56 patients with duodenal ulcer (160). (a) shows a fall in pH to a mean of 1.41 and (b) shows a fall in pH to a mean of 1.73. The timing of meals is shown by the horizontal line indicating sleep and wakefulness.

tid and 400mg noct.¹⁸ Working with colleagues at the General Middlesex Hospital, London, and Queen Alexandra Hospital, Croydon, we have recently completed a trial in 115 duodenal ulcer patients comparing ranitidine 150/day with ranitidine 300mg/day for four weeks. 84% of patients healed on ranitidine ranitidine and 77% of patients on ranitidine treat

more.¹⁷ In a continuation of this trial 31 patients completed one year's maintenance treatment during which 24.2% of patients relapsed on cimetidine and 25% on ranitidine.¹⁸ (See maintenance treatment.)

Recent work has shown high-dose treated therapy at a dose of approximately 450mg per day (with 3000mg if necessary or poorly) to be effective in healing duodenal ulcer.¹⁹ On this regimen at the end of four weeks 70% of patients had healed their ulcer in comparison with 42% on placebo. We have compared this treatment with cimetidine and have shown that over the daytime period high dose treated therapy is equally effective to cimetidine but that the H_2 receptor antagonist is significantly better overnight.²⁰ Despite the effectiveness of 24-hour treatment the convenience of taking an H_2 receptor antagonist designed to the seven doses of 300mg of which each day is clear.

Maintenance treatment

One of the problems of H_2 receptor antagonist treatment is that when treatment stops the course of duodenal ulcer disease returns to a pre-treatment level of relapse. This has prevented the use of cimetidine for

maintenance treatment and the suggestion by Martin²¹ that cimetidine is like an unsuccessful marriage: a moment of bliss followed by a lifetime of maintenance! Clinical trials show that maintenance treatment can be expected to reduce the relapse rate of duodenal ulcer which approaches 80% over 12 months to approximately 11%.^{22,23} as long as treatment is continued.

Maintenance treatment is indicated in those with acute outlet or respiratory disease some elderly patients, or the limited parietal patients whose being considered for surgery but in whom it would be most convenient, from the point of view of their work or other commitment, for this to be done at a later date. For young patients with more than three relapses a year, a highly selective vagotomy will probably still be necessary. We have compared the effect of "medical vagotomy" using the H_2 receptor antagonist cimetidine with highly selective vagotomy within the same duodenal ulcer patients. Both treatments showed a highly significant reduction of ulcerogenic acidity but highly selective vagotomy was significantly better than cimetidine 1600mg daily at reducing mean 24 hour intragastric acidity.²⁴

Table 1
Duodenal ulcer relapse rate (H₂RA)

NORTH EASTERN/1000 PER	
1972	1.96
1973	1.71
1974	1.68
1975	1.74
1976	1.70
1977	1.67
1978	0.88
1979	1.03

GRACE & SCHWARTZ²⁵

Table 1
Week day healing to treatment ulcer
(in the 1970s)

WEST LINDSAY/1000 PER	
1972	44.8
1973	46.0
1974	45.3
1975	47.3
1976	43.8
1977	23.6
1978	34.6
1979	29.7

WILSON & SCHWARTZ²⁶

The effect of changes in management of Peptic Ulcer

The effects of changes in both diagnosis and treatment on peptic ulcer in the Royal Navy have been dramatic. Although the number of diagnoses upper gastrointestinal endoscopies has increased from 100 in 1972 to 508 in 1980, duodenal ulcer as a percentage of these endoscopies has remained almost static at 11% (Fig. 1). During the period between 1973 and 1974 duodenal ulcers as certified on F Med 14s fell from 1.06 per 1000 to 1.03 per 1000¹² (Table 1). There was also a fall in the number of working days lost in the Royal Navy and the Royal Marines between 1972 and 1974 from 44.1 to 19.7 per 1000 men (Table 2). There is evidence in the UK¹³ and the USA¹⁴ that the number of operating operations for peptic ulceration has

FIGURE 1. The number of operations for both duodenal and gastric ulcer performed in HMS Humber between 1972 and 1980. The series is for 1975 shows the introduction of endoscopic diagnosis but although the drop that already exists is visible, the impact has been



FIGURE 2. The number of operations for both duodenal and gastric ulcer performed in HMS Humber between 1972 and 1980. The series is for 1975 shows the introduction of endoscopic diagnosis but although the drop that already exists is visible, the impact has been



FIGURE 3. The number of operations for both duodenal and gastric ulcer performed in HMS Humber between 1972 and 1980. The series is for 1975 shows the introduction of endoscopic diagnosis but although the drop that already exists is visible, the impact has been

decreased since the introduction of endoscopes in 1975. At HMS Humber a similar fall was seen following the introduction of endoscopes in 1976 (Fig. 2) although there has been a slight rise again since that time which has also been observed in the UK.¹⁵ The most dramatic change has, however, been seen in the reduction in the total number of operations, from both the RN and RM for duodenal and gastric ulcer from 47 in 1968 to one in 1979 (Fig. 3) and the reduction pattern is maintained when peptic ulcer is taken as a percentage of total operations.

Surgery and Conditions

The pattern of peptic ulcer in the Royal Navy has changed dramatically over the last decade. There has been a decline in duodenal ulcer notified on F Med 14 and in working days lost. Surgery for peptic ulcer at HMS Humber has also been reduced, while operations for peptic ulcer have been almost abolished.

It is concluded that the major contributing factors to these dramatic changes have been the establishment of specialized gastroenterology units with trained gastroenterologists, rapid and accurate diagnosis by upper GI endoscopy, the limitation of peptic treatment programmes with the H₂ receptor antagonists and consolidated changes in medical and surgical management policy. Other factors may have been contributory but work must continue in this field to identify better those patients who will need surgery and in final steps in which prolonged duodenal ulcer treatment can be obtained. Meanwhile these advances represent an enormous saving in working time and especially manpower conservation fully justifying the introduction of specialized gastroenterological expertise.

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Environment in Motion — HM Ships at Sea

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Part I. Biomechanical Aspects

A Working Party on Motion Sickness was set up by the Survival Sub-Committee of the Royal Naval Personnel Research Committee in March 1962 after survival trials had demonstrated a clear need for improved knowledge of the methods of preventing and alleviating motion sickness in our survival conditions. This Committee continued until November 1967 and the results of its work are summarized in their report.¹ The report recommended 3 hypotheses as the basis of choice of a design built into the usual deck at that time — especially for use by small troops about to go into action. For design over a longer period, drops of the anti-lurching group such as dressmakers' benches, photostays and aviation hydraulic seats were recommended. When possession of sickness is important and the performance of the personnel is not — as in survival on a lifeboat — 3 hypotheses were still recommended and the study of subject and for self-administration suggested.

In an earlier unpublished paper (c. 1959) T. H. Williams defined the possible need for study of various aspects of human performance in the moving environment of ships at sea. These aspects were:

- Performance decrement directly due to ship motion: eg. plotting and tracking tasks in other similar tasks requiring accurate hand/eye co-ordination.
- Performance decrement due to motion and other symptoms of motion sickness.
- The role of drops in combat motion sickness.

d. The side effects of such drops in relation to performance of visual, auditory and decision-making tasks.

He treated one further aspect, as important at now as then, namely the effect of ship motion on simple biochemistry tasks involving muscular effort such as lifting, loading, climbing, pulling and pushing.

An RSPHC Working Party on Ship Motion was set up in October 1966, as the direct request of the Medical Director General (Naval) and first met in January 1967. Its remit was to examine studies in two main areas: first, the effect of motion on the control nervous system and its output and in turn on performance; secondly, the biochemistry effect of motion. It would thereby answer the questions posed in Dr Williams' paper. This paper is a speculative attempt to state the problem in more formal and to suggest what motion are needed and might be possible.

Let us first examine briefly the accelerations with which we are concerned hereafter. Ship motion typically consists of a narrow band of high amplitude low frequency movement with a wider band of low amplitude motion of higher frequencies superimposed upon it (Fig. 1). It is usual to

CHARACTERISTIC SHIP MOTION: ROLL, PITCH AND YAW



Fig. 1. Acceleration characteristics.

describe these accelerations in relation to the coordinates shown in figure 2.

The ship moves along the three translational axes shown, namely X, Y and Z, and also rotates about these same three axes respectively as roll, pitch and yaw. A ship is relatively rigid and therefore rotational motion produces in effect a translation at a point on the vessel which increases linearly with the distance of the point away from the ship's center of rotation. Subjectively the sailor senses these accelerations as heave and the effects they have on him from a biodynamic aspect can also largely be considered in linear terms.

Figure 3 shows a breakdown of typical ship motion data obtained by Southampton University's Institute of Sound and Vibration Research (ISVR) in recent studies by Lawther.¹ The power spectrum of each time history is shown on the right. The dominance of the vertical and pitch can easily be seen. The figure also shows a heaving effect which Lawther suggests may be due to the wave encounter frequency heaving with a natural pitch frequency of the ship (also shown in fig. 5). Perhaps this is the origin of the "seaworthiness" latitude of the sea. Certainly it indicates the influence that hull design may have on the levels of acceleration encountered at different points on the ship.

The difference in frequency to roll and in the Y axis is all the more true accelerations can also be seen in the power spectra (fig. 2). The influence of pitch on vertical acceleration is seen in figure 4 which plots the vertical power spectra versus location on the ship, the maximum being found at the stern and stem.

There are three major parameters of ship motion, the acceleration levels which describe the power or energy encountered in the motion, the rate of change of that acceleration and the fundamental frequency of the motion. These accelerations are usually expressed in terms of " g "'s, motion per second squared (m/s^2) or d^2



Fig. 2 Coordinate axes

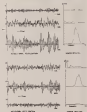


Fig. 3 Typical ship motion data¹



Fig. 4 Variation of z axis acceleration with wave frequency

average foot sweep against the vertical. It varies in the amplitude of the modified sine wave. The rate of change of acceleration is seen in the slope of the waveform, and expressed in m/sec^2 . The frequency is usually expressed in Hz and indicates the number of waveforms swept per second. As we shall see, all these parameters have a clear influence on locomotor performance, while two, the power and frequency of what is, in fact, a very low frequency vibration are the factors which seem to be largely related to motion sickness. One cannot in truth really separate the three parameters as each has an intimate multidirectional relationship with the other two.

Step motion is usually measured by a combination of linear and angular accelerometers placed close to the centre of motion. Accelerations at different points on the step can then be calculated. However, the calculations are complex and angular accelerometers are both expensive and more complicated to use than linear. Lawless and Griffin at DNR have developed a elegant technique using an linear accelerometer placed as shown in Figure 5, employing three accelerometers close to the centre of motion, two further forward and one laterally. These measure the motion at each point as shown in the diagram indicated by the arrows, and the waveforms are recorded on tape. The data is then analysed by computer programmes at DNR and the technique can give full details of linear and rotational angular acceleration at any point on the step.



Fig. 5. Accelerometer supply movement with step motion and a subject.



Fig. 6. Posture—dynamic of force.

Having looked at some of the characteristics of the motion let us now estimate the effort they may have on heavy muscular tasks on board. Figure 6 shows an the parameters from the mass forces involved in the act of pushing a heavy load in for example when moving its turret, a pallet load on a Royal Fleet Auxiliary or even shoving a heavy bulkhead door against ship movement. Muscular strength and posture are involved but the limiting factor is the force that can be transmitted through the foot, shown as BF, and that is governed by the coefficient of friction μ and the resultant of the man's weight, shown as VF acting through his feet. The coefficient of friction will stay the same provided the deck is not in a state of oil but VF will vary directly with step motion by a factor which might be as much as plus or minus a half its nominal value in a severe sea state. This will affect the tendency of the foot to slip if BF cannot exceed a x VF. Suppose in this particular physical activity is the continuous nature of injury.

Pulling (Fig. 7) is similarly affected by the constant reduction of W in ship motion with similar consequences to pushing unless the alternative posture shown in Figure 8 is adopted. This attitude is mechanically efficient but would require great strength and from the point of view of risk of injury is already less disadvantageous even in a temporary environment.

Due to the biomechanical aspects of the task heavy lifting carries the greatest risk of physical injury (Fig. 9). Posture, skill and weight-carrying past experience and, as any student of weight lifting will tell you, a good solid stance is vital. The latter is responsible to achieve on a moving platform and, coupled with a constantly varying body weight (W) and lifted weight (W_1) the risk of injury must be increased even further. In a combination of lifting and pushing or a sudden loss of control could result in a severe fall.

If we wish to quantify the aforementioned and other minor problems in relation to the strength and ability of the general naval population then static biomechanical studies are necessary. Many techniques have been devised for such studies under controlled conditions including force platforms, potentiometers, high speed photography and the like. Most are unlikely to be suitable in such unpredictable circumstances as a ship. However one technique devised in the Department of Human Biology and Health, University of Surrey seems particularly suitable especially for studies of lifting. Davis¹ has noted that internal nociceptivity is rapidly accompanied by considerable increases in intra-abdominal pressure. Davis and Thomas² showed a close correlation between the magnitude of forces on the lower spine and the magnitude of these increases in intra-abdominal pressure. Smith³ and Davis and Smith⁴ noted that occupations in which peak intra-transtest pressures of 1.50 mmHg or more are reduced had an increased ability to tolerate back stresses. In the above studies abdominal



Fig 7. Pull (from side) - dependent of force



Fig 8. Pull (backward) - dependent of force

pressure was measured via a pressure sensitive "radio pad" which is installed prior to the experiment so that signals are monitored externally and recorded on a chart recorder. There being no need inter-fering with the subject, and as the pressure is related to the load on the spine (Fig. 10), whether influenced by environmental motion or not, this method would appear to have considerable advantages for studies on board ship. It has already been used on behalf of the Navy to support the necessity of the loading technique proposed for a certain weapon. A number of other studies have also been carried out by Davis and Smith in conjunction with the Army Personnel Research Establishment.¹ Such losses have been established for stationary environments and are presented in the form of suggested limits for stationary standing two-handed lifts (Fig. 10) and for one-handed pushes (Fig. 12).¹ Similar limits could be experimentally



Fig. 10: Five stationary pressure records of a subject lifting 10 lb. box, 100 percent from floor and the subject carrying 10 lb. box up to a height of 3 ft. using the technique.



Fig. 11: Diagrams of safe levels of lifting for one-handed vertical lifts.



Fig. 12: Diagrams of safe levels of lifting for one-handed forward pushes away from the body.



Fig. 13: Diagram of lifting

defined for various levels of ship motion. Once levels of sea pulling and pushing have been established the requirements of threshold stresses can be calculated and produce for the task defined topic.

It would seem likely that the character rate of ship motion that will most affect tasks like those described will be the peak levels of acceleration. However the rate of change of acceleration, especially those sudden changes due to heading or changing, may be a critical factor in the cause of injury.

Let us next examine the effect of ship motion on the performance of flat or curved shafts. The degrading effects of low amplitude high frequency motion (that is vibration) on manual control shafts are well known. Much less is known about the effects of the high amplitude low frequency swaying of ship motion on these shafts. Tasks which contain such skills are found in the operating theatre on some ships, the operations room, the bridge and in weapon control consoles. They include plotting tasks, tracking tasks, data manipulation by way of keyboards, and the acquisition and destruction of flat moving local targets. Three types of control that might be found in use in such tasks are shown diagrammatically in figure 12 in the form of a joystick, a joystick and a directional position button control. As it is studied the effects of the simulated, relatively narrow motion of a surface effect ship on manual control shafts and they demonstrated a marked deterioration in those skills. Method *et al.*¹⁰ employed much lower levels of acceleration on the ship motion simulator at Warren Springs, Sawtrey, to show a number of less marked deteriorations caused by the simulated motion of an RN frigate at 25 knots in a three degree. The tasks chosen were a free moving tracking task or weapon plotting, a pursuit tracking task on a visual display and similar to that of weapon control and a ship laying task. The pursuit tracking task was studied in two

TYPES OF CONTROL



Fig 12 Types of controls

modes, one using a spring centred, free moving joystick and the other a pressure control joystick (which does not move). They demonstrated a variable but serious deterioration in the tracking task, a reduction in performance of the pursuit tracking task and virtually no effect on keyboard performance. The study was a preliminary one and limited by the capabilities of the Warren Springs motion driver. The accelerated showed reliable changes in performance as a motion will follow 1m/s² rms at about 1 Hz. Much more knowledge is required — especially in entry stage sophisticated drivers employing these types of control and smaller manual control shafts are now being designed for Royal Naval vessels.

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Hazards of Enclosed Spaces — Reduced Ambient CO_2

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Introduction and Review

The control of the atmosphere within a submarine depends on many interrelated factors. Nuclear submarines, with a reliable and large supply of electrical power, permit control with dedicated equipment which can function continuously during a long submergence. In conventional submarines (CSRs) control is intermittent with frequent ventilation periods.

The Medical Director General (Naval) (MDDG(N)) has the responsibility for recommending Maximum and Minimum Permissible Concentrations (MPCs) for each atmospheric constituent. The designers and constructors have the task of fitting suitable equipment to meet these MPCs. With the ever increasing pressure on space, medical research is essential to check the best advice can be given at the design stage and this is achieved by a standing MDDGP representation on the DG Stage Submarine Air Purification Committee.

Carbon dioxide is one of the most important constituents and research into its effects on man at low concentrations has been undertaken by several naval institutions. However, in comparison have shown that human exposure to CO_2 in the range 0.5–2.8% produces a mild transient respiratory alkalosis with PCO_2 increases in the order of 2.3 mmHg^{1,2,3} and a fall in pH from 0.02 units at 0.5% to 0.40 units at 2.5%.⁴

Changes in minute ventilation (\dot{V}_E) have been found to be dependent on the inspired PCO_2 with mean increases of 30% at 0.5%

CO_2 ,⁵ 30% at 1.8% CO_2 ,² and 80% at 2% CO_2 .³ Ventilation tended to fall back to control levels during the exposure but above 1% this observation was less noticeable. No changes in respiratory rate were observed in any of the studies; the rise in \dot{V}_E was thus due to an increase in tidal volume.

Reported changes in renal and/or bone turnover are inconsistent. Early English studies⁶ and the work of Schacter⁷ demonstrated marked changes in hydroxyapatite and osteon formation. These are now felt to be artifacts of the methodology employed. However, Ogilvie and Radzinski⁸ reported a small increase in osteon formation during the latter part of a 36 day exposure to 2% CO_2 .

The effects of low level CO_2 exposure on mineral balance are still in dispute. Early work by Gray et al.⁹ and Schacter et al.¹⁰ indicated a fall in bone calcium during the CO_2 exposure period. Other human solution exposure experiments, restricted to CO_2 exposures carried out at 194M, have demonstrated smaller changes in calcium excretion, suggesting that in the absence of a long control period, vitamin effects on calcium metabolism may be misinterpreted in a CO_2 effect. In more recent French studies at 0.5 and 1.8% CO_2 , similar changes were observed which could not be linked to CO_2 exposure.¹

The effects of low sea/low physical activity or high levels of exercise, both of vitamin D and diet are all known to significantly affect calcium metabolism. Studies where these variables are controlled have

needed to show not only a small change in this maximal response, recent American studies suggest that low level CO₂ exposures induce changes in carbon metabolism in humans [11].

Practical Considerations

The current MPC [12] for nuclear sub-marines is 1.0% (1.0 monthly). This level has only been interpreted as an [12]. The results were too variable to be considered in the short term alone. French workers currently undergoing levels of 0.5 and 1.0% CO₂ as part of the Anglo/French Collaborative Programme provide evidence only up to this latter level. The sole evidence for the effects of 1.0% CO₂ exposure are those provided by the US "Haloan" study in 1960 [13].

It is currently under discussion that the 1% MPC for CO₂ for SSB operations could be relaxed if there was physiological evidence that levels up to 1.0% are acceptable in both the short and long term. This would depend on the following:

- a) That the respiratory quotient is not significantly greater than that observed at 0.5 and 1.0%.
- b) That on a controlled diet supplemented with vitamin D and with a regular exercise regime subjects do not demonstrate a significant CO₂ induced change in carbon metabolism.
- c) That the CO₂ induced increase in ventilation is acceptably small.

If these conditions could be satisfied, recommendations by MEDCON could be made advising that the latest MPC currently remains at 1.0% with individual exposures to 1.0% as operationally expedient rather than applying an MPC of 0.5% as recommended by MEDCON in 1979. Such a recommendation would lead to a considerable saving in research and development with new CO₂ absorption systems.

Methods

Twelve medically fit military volunteers

were admitted to the Environmental Medicine Unit chamber for 30 days. They were familiar with the procedures of the study in accordance with the Helsinki Agreement concerning the conduct of non-therapeutic clinical research. The trial was single blind and for the first 14 days the volunteers were breathing fresh air. On day 15 to day 44 when the ambient CO₂ was maintained at 1.0% (0.1 monthly). On day 45 they returned to fresh air until the end of the study. Further aspects of the methods are addressed in the following two graphs.

Respiratory quotient. Any metabolic changes which may occur as a consequence of exposure to CO₂ must be a function of the measured PCO₂ or acidity of the blood. The first question to be answered therefore are what is the response in blood PCO₂ and what if any is the fall in pH? Secondly what is the degree of hyperventilation induced by this level of CO₂ and is this acceptably small?

Breathing study. To these ends, respiratory measures were conducted three or four times weekly throughout the experiment. Subjects resting on a couch expired through an integrating pneumotachograph and a flow resistance free valve, expiring into 100 L Douglas bags. End tidal gases were measured at the mouth using a Cioxmox GasAnalyser Mini Spectrometer. Four minute expired air collection was made. On completion of this test, each subject was transferred to a study and the majority of a second mini spectrometer taped onto the subject's nostrils. End tidal gases were again measured until the subject was breathing on a relaxed and regular mixture of 175/200 µl of arterialised capillary blood into their nostrils from the ear tube which had previously been circulated with their nasal nostrils. This sample was then analysed on a Cioxmox EEL 165 blood gas analyser for PO₂, PCO₂ and pH. Lastly, the subject's mixed venous PCO₂ was measured using a catheterising method, end tidal PCO₂ being measured to



Fig. 1. Effect of exposure to 1.15% CO_2 on arterial capillary, venous/buccal and on the inspired and inspired venous PCO_2 , gas-cultured capillary pH and venous bicarbonate. Horizontal bars represent period during that exposure to CO_2 was made below the control value. Mean ± 1 S.D.

Arterial and PCO_2 plasma

The results of the PCO_2 and simultaneously recorded P_{a} , CO_2 showed an almost identical pattern with a highly significant sustained increase of about 4 Torr during the gas period with a rapid fall to control levels during the recovery period. (The results of the PCO_2 measurements are shown in figure 1). Similar changes were observed in P_{v} , CO_2 measured at the mouth and in P_{vCO_2} . However the CO_2 induced increase in these cases was slightly less — 3 Torr.

The changes in arterial capillary pH induced by the CO_2 were also with a sustained 0.02 pH unit fall throughout the exposure period. Control and recovery period levels were statistically indistinguishable. The increased PCO_2 and $[\text{H}^+]$ induced a net in calculated standard bicarbonate of 1.5 mmol/L (Fig. 1).

Measurements of inspired and expired ventilation gave similar results although methodological variations were less with the inspired measurement. \dot{V}_E was increased by about 25% throughout the exposure period (Fig. 2). Analysis of the subdivisions of ventilation revealed a small fall in respiratory rate throughout the experiment with a compensatory rise in tidal volume induced by the CO_2 exposure. Tidal volume rose during the gas exposure by an average 300 ml as a consequence of the raised CO_2 .

Physiological deadspace remained basically unchanged; thus the increase in tidal volume and in total minute ventilation were paralleled by the increase in alveolar ventilation. This increase in \dot{V}_E induced a rise in P_{a} , O_2 measured both at the nose and the mouth and in capillary PO_2 of between 4 and 5 Torr. No changes in VO_2 , VCO_2 or R were apparent either as a consequence of the CO_2 exposure or confinement.

CO_2 responsiveness was measured both in the ventilatory CO_2 and maximum rate of respiratory pressure development ($\dot{P}_{\text{a}}/\dot{V}_E$).

most response to a steadily rising and total PCO_2 . There was no obvious CO_2 induced



Fig. 3 Effect of working in a 2.0% CO_2 atmosphere on subjects while they were exposed to increased during steady breathing, slightly reduced during the steady breathing, all values are corrected to 30°C. Horizontal line appears period when the 2 subjects measurements taken for several minutes. Interval of 10 subjects.

changes in either the slope or intercept values, although the intercept value calculated from dV/dt was needed to be lower during the gas period, similar to that observed at 0.5% CO_2 .

Exercise study. On each Sunday of every week, subjects continued at their self maximal work loads for six minutes each separated by six minutes rest. Heart rate was recorded during the last minute of each work. These values collected over the first two weeks of the experiment were used to calculate work rates for each subject which corresponded to 25% and 60% of their predicted VO_2 max. On the Monday of each week subjects rested on an electrically braked bicycle ergometer while respiratory measurements were made, as in the lower resting study, with the addition of the heart rate. Subjects then exercised at 25% VO_2 max for six minutes, followed immediately by a further six minutes at 60% VO_2 max. The same measurements of vent tidal gas, ventilation and respiratory gas exchange were made. Figure 3 shows the results of heart rate and total PCO_2 and ventilation throughout the study for the three conditions. In assessing changes in these variables, the first two weeks measurements should be discounted as these were different from the latter work rates which were constant for each subject for the remainder of the experiment. Figure 3 demonstrates a slight increase in heart rate during the first half of the experiment indicating a small decrease in group fitness. Fitness appeared constant during the latter half of the experiment. Further analysis of the "Sunday data" is required before further quantification of these changes can be achieved.

The CO_2 induced increase in $\text{P}_{\text{ET}} \text{CO}_2$ at rest was greater than that observed during the lower resting study, i.e. 2 Torr. The increases during exercise were similar to 3-4 Torr. Corrections from the end tidal level to the mean alveolar concentration were not carried out as changes rather than



Fig. 3. Effect of 10% CO_2 on the heart rate and arterial PCO_2 and ventilation, a typical example. At 20% and 40% of postural VO_2 max. Ventilation was measured as \dot{V}_{E} . Five subjects taking in the large volume room. Means of 11 subjects.

absolute values were the first requirement of this study.

The changes in PCO_2 were reflected by ventilation. Subjects appeared to over-ventilate during the control and recovery period relative to the gas period when resting on the bicycle ergometer.

During exercise the CO_2 induced hyper-ventilation was more apparent. Thus it appears that sensitivity to CO_2 was dependent upon the level of attainment of the subjects. When very relaxed (rest) on a metabolic ventilation increased appreciably leading to a $\text{P}_{\text{ET}} \text{CO}_2$ increase of about 3 Torr. During the ventilatory increase would appear to be low leading to a $\text{P}_{\text{ET}} \text{CO}_2$ increase of 4 Torr, whilst sitting on a bicycle the CO_2 induced increase in ventilation was slight and $\text{P}_{\text{ET}} \text{CO}_2$ rose by 5 mm HG.

Conclusion

1. 5% CO_2 induced no increase in blood or end tidal PCO_2 of between 3 and 5 Torr depending upon the status of the subject. Arterialized capillary blood pH fell by 0.02 pH units this fall being maintained throughout the exposure period. Blood pH returned rapidly to control levels on switching off the gas. Ventilation increased by up to 20%. No adaptive changes during the CO_2 period were observed. The responses during recovery were similar to those observed at rest.

Mixed and Metabolic Acapnia

In view of the observation increase in ventilation O_2 levels and voluntary apnoea and exertion, exercise and voluntary apnoea during intense and voluntary ventilation this study incorporated a rapid control of exercise and diet as follows:

- Mean rates were plotted against three work rates and extrapolated to a predicted VO_2 max for each subject.
- Using the above and a detailed history of the subject a control accuracy special physical training routine were designed for each subject.
- All food was supplied by the dietary kitchen at the Royal Naval Hospital Haslemere to provide:

	On day previous
(1) Available carbohydrate	100g
(2) Fat	150g
(3) Protein	100g
(4) Calcium	2500 mg
(5) Potassium	10000 mg

Ventilation rose 20% for only one day during to 10% rise in O_2 the period. Minor changes were made to an individual's requirements, 10% fat high at this time for 10 days. The average expenditure of 600 kcal was 11.5 ml (range 11.1 to 12.4 ml per day).

- Daily fluid intake was regulated to 1500 ml (±200 ml).
- Daily food intake was augmented with two vitamin D capsules (400 IU).

All urine samples and blood specimens were collected for analysis. On certain days each specimen of urine passed it was analysed.

immediately for NH_4^+ , HCO_3^- and Na^+ Anal to assess renal and bone response to CO_2 . Twenty-four hour urine samples were analyzed for Na^+ , K^+ , Ca^{++} , phosphate and creatinine. Each day six duplicate anal was collected and analyzed to check calcium levels. All fecal specimens were collected. These specimens were weighed, desiccated and analyzed for calcium content.

Routine hematology and full biochemical tests were carried out regularly during the study. These comprised measurement of serum creatinine, total phosphate, Ca^{++} , albumin, total protein, HCO_3^- , K^+ , Na^+ and alkaline phosphatase. At weekly intervals additional samples were taken for cortisol, growth hormone, thyroxine, FTH and ACTH. Five samples were taken for serum vitamin D (25-OH-D).

The respiratory chamber as follows:

Method. No changes occurred in mean serum potassium, sodium, albumin, urea, phosphate, albumin, total protein or alkaline phosphatase throughout the study. Mean serum calcium fell significantly by 0.07 mmol L^{-1} immediately following the gas on (day 42) but returned to control levels within the next seven days. Thereafter the levels are not significantly different from control values (just below 1.0). There was considerable variation in daily gross volume, potassium and phosphate excretion but no changes related to the CO_2 exposure were seen. Daily urinary excretion of calcium showed a slow fall during the study with a more pronounced fall during the last seven days (Fig. 4). From the analysis of the foods provided and converting the food net mass from the records on metabolism bag there, over five-day periods the mean daily intake of calcium was calculated over the study as 38 mmole. The derived daily faecal calcium excretion amounted to a few day basis into the water at the start of the trial and at the end. Serum vitamin D showed a



Fig. 4 Mean serum calcium vs. CO_2 exposure. Mean daily urinary calcium excretion vs. CO_2 exposure. Mean daily urinary volume vs. CO_2 exposure. Mean daily urinary potassium vs. CO_2 exposure. Mean daily urinary phosphate vs. CO_2 exposure. Mean daily serum vitamin D (25-OH-D) vs. CO_2 exposure. The vertical line at day 42 indicates the start of CO_2 exposure.

small increase throughout, but all levels were within normal limits. Serum creatinine fell significantly immediately after the CO_2 exposure (day 42) and then rose to above the control levels. Daily creatinine excretion showed a slight trend up during the study until the end of the CO_2 exposure and then fell slightly. These changes are reflected in

the ventilation: circulation ratio (Fig. 3).

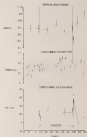


Fig. 3. Mean arterial pressure in 7 AEMU men: daily systemic circulation resistance and pulmonary vascular resistance are measured for 48 h. The 6 h 1 AEMU $n=12$.

Respiratory Acid Base Response. There was a transient fall in mean daily $\text{BE}(\text{CO}_2)$ and a rise in mean daily pH , and not acid excretion following the gas on day 15. There was a second transient rise in pH 7 days later at the end of the gas exposure. Following the return to fresh air (day 40) net acid excretion fell to below control levels (Fig. 4).

Haematology. There was a slight decrease in haemoglobin concentration and red cell count during the study, which was probably related to the extensive minor postural venous employed. Subjects had approximately 1 litre of blood taken over the 6 week period. This prevents any interpretation of possible CO_2 effects on red cell volume or erythropoietic regulatory

However, no changes occurred in the gas on or off periods indicating no pronounced CO_2 effect.

Hormones. On eight occasions (3 control, 4 gas period and 2 post gas) subjects were bled at 0800, 0900, 1100, 1500, 1800 and 2300 for hormone estimations. No changes were detected in circulating PTH levels which showed no circadian rhythm. Growth hormone, ACTH and cortisol levels showed classical rhythms but were not affected by the CO_2 exposure. Adrenomedullary showed a normal rhythm throughout but the sample taken immediately after CO_2 gas on and gas off at

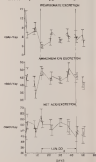


Fig. 4. Mean daily urinary excretion of net acid and net bicarbonate for 7 AEMU on selected days during the study $n=12$.

PTH were significantly lower than control values and the final sample at the end of the study was significantly raised (page test) (Fig. 7).



Fig. 7 Plasma parathyroid hormone (PTH) sampled at 12, 18, 24 h, $n = 12$.

The Subjects. The general health of the subjects was not affected by the CO₂ exposure; however detailed analysis of the sleep patterns for this study is not complete. They were not aware of being exposed to 5% CO₂. One important observation was made during the first three days on fresh air following the exposure. The subjects looked pale, the application of rubricants to the ear-lobes prior to blood sampling led to a much reduced vasodilatation, and there was a reduced blood flow on sampling indicating a general peripheral vaso-constriction.

Conclusions

- The fall in calcium excretion observed during the study is most probably a chamber/narcosis effect. Although a CO₂ effect cannot be excluded as a full control experiment has not been carried out at this stage, there is no evidence of a change in the pattern or profile points.
- The changes in creatinine clearance were after the CO₂ exposure may be due to vascular changes similar to those observed preoperatively.
- There is a small renal acid base response to CO₂ which is not sustained.
- Developing a tolerance appears to have been altered by this study.

- PTH levels were not affected.
- There was no effect on the levels of serum ACTH or growth hormone nor on the circadian rhythm of any of these hormones.

Overall Conclusions

From the presentation it is apparent that a 30 day exposure to 1.5% CO₂ has noticeable effects on many physiological variables, most of which refers to diurnal levels within a 12 day period on fresh air. Although further detailed statistical analysis of the data is necessary, taking into account the results of our French colleagues at CERMet Toulouse and the earlier work at INM, we say we need to reduce the present CO₂ HFC_{max} of 1.0% to 0.5%. Further more it would appear to be reasonable to accept an HFC for environmental concentrations of 1.5%. If these preliminary views are shown to be valid, then there will be a considerable saving in expenditure on space and costs for future operations.

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Ergonomics and the Aviator

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Introduction

Ergonomics is a subject which is becoming increasingly recognised in industry including aviation. However, there are still those who may be unfamiliar with ergonomics, do not understand what it implies or do not believe that the application of ergonomics principles has a place in aviation. This short paper will discuss these points and as in the case for human

aviation — they can do the job better. "We always managed before!" The money would be better spent on hardware.

However, the very real and sophisticated use of aircraft requires the use of ergonomics. The overall objective agreed by all parties is to optimise operational performance and efficiency. It is not cost efficient to have a highly trained aviator who is unable to use his talents because of a poor working environment, or to have a highly sophisticated aircraft that cannot be used to its full potential because of poor design.

Ergonomics

What is ergonomics? The original definition was work station design, mainly in heavy industry. But this was limited to the design of controls and displays for ease of use and to avoid confusion. In interpretation of the displays, a certain amount of understanding (knowledge and experience) of the situations in people are used as well. Now ergonomics is interpreted as a "systems approach to the man-machine interface" dealing with all aspects affecting a person at his work station. The breadth of the area is judged by a typical postgraduate degree course in ergonomics which includes physiology, experimental and applied psychology, systems analysis, biomechanics and statistics. Thus it is truly a multi-disciplinary subject.

One would have thought therefore that the place of ergonomics in aviation was universally accepted, but arguments are still used against it. These include: Why involve ergonomics pilots? By the

Human Performance

An aviatorman is in a control loop with a feedback system with his aircraft. He receives information about the status of the aircraft from his eyes and the aircraft's sensors. These are interpreted in his brain (computer) and responses are made via the aircraft controls. Man's, that is the crew's, performance can be affected by a degradation in any part of this loop.

Thus an understanding of the factors affecting aviator performance is vital, especially the operation of the human brain.^{1,2} The brain has been compared to a computer and man's computer has some unique properties — two of the most important in aviation being flexibility and the ability to make judgements through reasoning. It does, however, have its limitations and needs to be operating at peak efficiency. Some factors affecting this are:

a. Arousal level. The concept of arousal and

an effect on performance basically states that arousal can vary from sleep to a hyperarousal state. Performance varies with the level of arousal and is also affected by factors such as the task, time on the task, type and number of stresses present, and the personality of the individual.

b. *Limited processing power* The brain is capable of single channel processing only — that is, we can only do one thing at a time. The required distraction in everyday circumstances is that we can do more than this. An example is driving a car and listening to the radio or talking simultaneously but the 'parallel sub-channel' processes can only cope with practice and the acquisition of skill. When conscious attention is needed to deal with a situation not previously encountered or one demanding much mental effort the computer consciousness in that task activity is the detriment of the others. It has been found that the computer works efficiently when the task or tasks are being performed subconsciously by the sub channels with the main 'super channel' monitoring progress. Thus workload is also highly relevant.

c. *Workload* Identify the demands of a task or combination of tasks should be less than the mental capacity. The relationship should result in what is described as spare mental capacity. If the workload becomes too great or if mental capacity is reduced through inappropriate arousal levels then whatever extra workload will occur with consequent reduction in efficiency.

d. *Stress* As described previously stress affects the arousal level. In addition to the physiological effects of stress there are psychological effects. These include coping of stresses from conscious, repetitive etc. and all can be explained by the limitations of the single channel processor. They are obviously undesirable in the potentially hazardous environment of the worker.

Thus the application of sound ergonomics principles should be reported in order to keep workload and fatigue at acceptable levels and to maintain efficiency.

Accidents

Accidents with ergonomic implications have occurred mainly because poor design and layout have resulted in confusion and error. Increased knowledge of human performance has resulted in a reduction in potential accidents due to error. Accidents attributable to a good example. The standard situation has been cited in a major aviation failure in control accidents? Experiments determined that the method of presentation — three pointers on a clock type face indicating heading, altitude and time decreased first — was less appropriate. The pilot is required to assess both rate of change of altitude and height altitude (qualitative and quantitative information respectively). A digital readout is better for the latter. Current altimeters feature both a moving pointer and a digital readout to optimise both requirements.

Future Trends

The increasing complexity of aircraft and their systems has accompanied a growth in the number of controls and displays. With the limited space available, these have been squeezed into undesirable areas and clustered together upon increasing the potential for confusion and error. Recently a trend towards integration of displays and information via management systems has occurred. Theoretically this should be beneficial giving a reduced workload and improved presentation of information. Integration has meant keyboards and VDUs and great care in design is needed to avoid making the keying response difficult for the crew and increasing the time required to gain the necessary information. Automation has decreased the workload of human crew but can result in accidents if the crew are not alerted to malfunctions —

other system on human induced in a recent civil aircraft incident on weekend dropped 10 000 ft because of incorrect procedures and fault diagnosis by the crew who had insufficient knowledge of the automatic systems and had failed to carry out correct maintenance work.⁴

1000

Then boys continue off the role and need for expression in aviation can be summarized by a statement made in 1928¹ when expression was in its infancy. There are six lots of so-called prominent market people back in and out of the lightning service, who put their faith in the automatic adaptability of the human body and mind. They find a few airplanes who seem to be able to put up with the new design and scheme which the new system

response They assume that all healthy people who may be in the presence, to do what a few extremely impressionable people will have themselves to do at a cost of great effort. They are people who are not willing to do it if the added signs of a real crisis should arise. All sorts of influences are required at the cost are not to be in the situation.

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The overall theme of Portman's findings is that the "new" forms of terrorism are not a new phenomenon but are a continuation of the old. The United States of America, he argues, has been the primary target of terrorism since the 1960s, and the United States has been the primary target of terrorism since the 1960s. The United States has been the primary target of terrorism since the 1960s, and the United States has been the primary target of terrorism since the 1960s.

Now shopping is the place to find the most diverse arrays of companies in any given market. Moreover, the average sale, I was surprised to find, is smaller because of the large shopping cartloads sent to the stores as well as the smaller and smaller quantities.

The book has 116 illustrations, half three-dimensional, some using various types of paper to achieve the desired effects. *Handy Art* shows three exciting techniques, especially easy and safe, to make a three-dimensional scene with three flat and previously prepared about 1 1/2 inch wide. The major problems of American spelling, grammar, punctuation and capitalization are clearly explained in this easy-to-use booklet.

The supplementary Workload and Efficiency Manual and Inventory Manual provide more

the probability of a signal, possibly increases the value of the test, in both positive and negative. This means that the use of physical experiments and observations, it is more or less certain, double the value of the test.

I believe the Institute will be a valuable addition to the anthropological library being in volume both to ethnographic literature growing in the Americas and Hispanic Chapters of the College of Anthropology, and to broader anthropological point to that that I find it useful to have.

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For Further Study: For the Learning Objectives for this chapter, see the end of each section.

This book has four primary sections. The first deals with the scientific, psychological and philosophical aspects of the study and measurement. There is a good bibliography with it, as well as an appendix on how to use the subject. The second half covers the clinical aspects and is written for all ages, all ages, ages 18 to the high twenties, all the way to old age. (There is also, for the practicing psychologist, a chapter on the various studies used in the study of aging. It lists 15 studies on the study of aging and a small list of greater data on a subject, from other sources.)

It is the author's policy to publish all data and to make all data accessible to the public in the form of a data archive.

Personal Protection against Cold Environments

Lieutenant (MS) M. Chandler RN

Abstract

The new Russian theory of battle cold indicates that the threat and physical aspects of battle cold involve major operational efficiency issues. During its development changes in reference to clothing classes. This paper discusses the reaction for maintaining personal clothing and equipment completely through the design stage. Implementation of the theory will allow other than uniform by the Institute of Naval Medicine.

Historical Background

The major climatic operational issue for NATO forces falls between temperate and arctic, encompassing ambient temperatures between 0°C and $+10^{\circ}\text{C}$. History reveals that major conflicts have often been influenced by climatic considerations such as army movements outside the comfort of the environment with which it is familiar. The end result often being that the losses suffered both from climate and numerically inferior adversaries fighting in their natural environment were such that one more powerful nation was hard pressed to defend their own borders. The experiences of Napoleon in Russia in 1812 and subsequently those of the German Wehrmacht in the winter of 1941/42 are classic examples of this in the European theatre. In the Chinese War and again in World War I, the British forces suffered heavily from cold injury — notably trench foot although in 1915 it was described as "trench frostbite". All told, the British suffered something in the region of 112 000 cases of cold injury during World War I and trench foot accounted for 3.62% of all

French battle casualties (Table 1)¹

COLD INJURY CASUALTIES WORLD WAR ONE

ARMY	118 000 (5.6% total)
NAVY	75 000 (10.4% total)
ITALIAN	25,000 (2.0% total)
GERMAN	40 000 (1.0% total)

1. Includes all cases of frostbite and trench foot.

Source: 101

The Americans were made aware of the problem in the Second World War in 1945. The United States Eighth Air Force had more casualties from frostbite than from combat,² as had in Europe the US Army had 91 000 casualties from exposure to cold.³ Of these, approximately 45 000 were from trench foot while the remainder were from frostbite, average hospitalisation was 30 days and only 15% returned to full active service. To make these figures more telling, 87% of these 75 000 casualties were from rifle companies. In December 1944, 85% of United States battle casualties in Europe were caused by cold injury. More recently during the Korean War the Chinese suffered heavily from cold injury during the winter of 1950/51 and while the United Nations forces did not cooperatively, a few lessons of the Second World War had been learned and they suffered far fewer casualties.

During the Indo-Pakistan conflict in

1971-1977 cases of freezing cold injury occurred within a short period of two weeks, most of them undoubtedly due to the troops being pressed down in open trenches by enemy fire for long periods.⁶ Even today, cold injury among Communist groups operating on the Northern Flank of NATO is still a problem,⁷ and the troops who are best equipped and trained to operate in conditions when opponents are forced to go to ground will have a tremendous advantage.

The Naval Requirement

Fortunately in modern warships the majority of personnel operate within a centrally heated environment, but there is still a requirement for personnel to venture on to the upper deck in adverse weather conditions to carry out a variety of duties. The speed, efficiency and safety with which they perform such duties is largely dependent not only on their skill and training but also on how well they are protected from the elements and the lack of consistent operational protective clothing causes on their movements. The speed and efficiency with which a replenishment at sea is completed or a helicopter is armed and fueled may make all the difference between the safety or the loss of a ship. In the present modern era, hardly armors count. The weapons and electronic warfare pulleys on one modern ship may be lightyears ahead of those used in World War II, but the clothing worn by the sailor is little different from that used in Nelson's day except that nowadays the outer layer may be made from a synthetic fibre and coloured orange. One often gets the impression that some of the computers that design and introduce such clothing believe that provided it's orange it will work!

The Problem

There are several reasons why protective clothing for sailors has not kept pace with

modern developments in the textile and garments industry, the most important being that the majority of modern warships dump complaints as part of their working environment. Unless they complain, and such complaints are fed into the system via Director General Supplies & Transport (Naval), then no one will be aware that a particular problem exists. On the other hand, they may not bother to complain because it involves too much paperwork, or they may feel that no one will do anything about it and, if they do, the solution offered will be politically to be any good. Why is this? More than likely it can be attributed to a badly assessed problem which, as time leads to a poorly designed and conducted trial, inevitably leading to an unsatisfactory conclusion. What is really required if any worthwhile results are to be forthcoming is:

1. Ergonomic and physiological assessment of the problem or freedom of movement required, workload to be undertaken, duration of work, ambient temperatures etc.
2. Meeting with people (such as naval officers) to select the right fleet for trials.
3. Construction of prototype by SCIDE or civil contractors.
4. Laboratory trials on a controlled environment.
5. Modification if necessary.
6. Fleet sea trials.
7. Further modification if necessary.
8. Repeat laboratory trials if necessary.
9. Continued formal evaluation.
10. Introduction into service.

Obviously that is a time consuming and expensive procedure, but the alternative is a badly assessed problem, subjective assessment of a work the solution, introduction of inferior equipment to the Fleet, re-assessment of the problem followed by another work the solution and so on.

END INVESTMENT

Advances in the textile industry and a changing emphasis in the naval task

the field a requirement to update the current cold weather clothing for shipboard use which was introduced following trials in 1966.¹ A pilot study by Blake and Ramsey² on board HMS *Norman* operating in the Arctic circle revealed the existence of thermal problems for light deck personnel. This was followed by a comparative trial of a variety of clothing assemblies made up of existing service items in a cold environmental chamber at RAE Weybridge on an ambient temperature of -40°C with a wind speed of 15 mph.¹¹ From the results of this trial no system assembly was recommended which considerably improved the lot of the sailor working in exposed conditions. Thermal insulation of hands and feet continued to be a problem. To date no solution has been found for protecting the hands without interfering with manual dexterity.

Following the field study by Blake and Ramsey² which suggested that the DMS foot was inadequate, DGSTIN requested INM to evaluate some prototype boots which had been produced by the Services Clothing Research and Development Establishment (SCRDSE) Culchester. This was done under the name 'mailing' agreed by Blake at RAE Weybridge using the DMS foot as the control. Postal chambers with calf thick and toe temperatures were measured at 15 minute intervals. It was found that of three heated and three cold feet were worn with the DMS foot the mildest provided was not significantly different from the two more expensive prototypes for the trial (Fig 1).

The Damage Repair Suit

The remaining sectors employed by the technical shops during the ice refuel and war highlighted a potential problem during damage repair parties working in partially flooded compartments at ships operating in Arctic waters. Working knee deep in icy water will quickly cause chilling which not only limits the individual's lot on the task



Fig 1

but also reduces his working effectiveness. One solution would be rapid rotation of working parties, but the supervisory staff and water rates are required to remain on task. A suitable garment had to be found which would protect the individual from the chilling effects of the cold water without impairing his working efficiency. The only in-service garments capable of meeting the requirements were the Arctic Swimmers Suit, the Washable Suit and the Once Only Survival Suit. Of these only a suitability included the use of the first two and durability and design the latter. A prototype low cost waterproof garment made from a polyurethane coated nylon was developed and evaluated in the damage control training module at the RNCD School HMS *Excellence*.¹² A number of physiological variables were monitored while the subjects — controls and those wearing prototype suits — were carrying out a simulated task. The results showed that in general the mean skin temperature of the control subjects was about 2°C higher than in the control group, but perhaps more important was the visible effects of the cold on the general condition of the subjects and their work rate and efficiency. None of the control subjects showed a net loss whereas all the control subjects did so and in most cases shivering was uncontrollable after 20 minutes, by which time their working effectiveness was minimal. In

contrast, all the tested subjects were warm and comfortable and appeared to be doing most of the work (Fig 2).



Fig 2

From these experiments it was recommended that a number of the suits be introduced into the Fleet, especially for deep-sea diving to waters below 10°C.

One place left for Fishery Protection

Interest was now directed to personnel engaged in fishery protection duties. These personnel may have to operate in ambient temperatures of around 0°C with the added hazards of weathered and accidental encounters. The problems faced by the fishery protection boarding parties were fully covered and, as no serious encounter is now possible, version of the damage report can now be produced while SCUBA diver and produced an alternative product after a prescribed period of protection; this has now been produced and will shortly be evaluated as it is field.

The 25 Man Lifeline

Following the introduction of the 25 man

lifeline to replace the 20 man raft, habitability trials were carried out in which metabolic rate, skin and deep body temperatures as well as the internal ambient temperatures of the raft were measured. From these trials¹¹ it was concluded that the raft was in need of several modifications to improve its habitability properties.

When these modifications had been made — which included the provision of a unit to separate bursts of the occupants from the floor of the raft thus reducing conductive heat loss to the sea beneath a more efficient method of securing the occupants and improving the still air space between the inner and outer canopy — further trials along the same lines were conducted using the modified raft in the model. The results of the modifications are clearly shown in figures 3 and 4.

Unfortunately solving the thermal problems created another habitability problem: the improved clearance of the

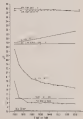


Fig 3 Time, body and skin temperature of 25 man subject, P-22, and corresponding temperature of P-22 sitting in modified raft during exposure to 1°C



Fig 1



Fig 2 Carbon dioxide levels: normal and normal + 10% (dashed line) and normal + 20% (dotted line).



Fig 3 Carbon dioxide levels: normal and normal + 10% (dashed line) and normal + 20% (dotted line).

capacity reduced, internal air movement as a danger when CO₂ build up when the raft was fully closed down became a problem. It was necessary to determine the speed and level of CO₂ build-up and to find a suitable venting system which did not drastically lower the ambient temperatures inside the raft.

The first study¹⁰ carried out in the laboratory indicated that a mean level (2%) could be reached within 30 minutes. However this did not take into account ventilation produced by the pumping action which might be expected in a worst instance. A further study¹¹ was carried out with a fully enclosed raft in the water tank at the Admiralty Marine Technology Establishment, Haslemere (Figs 3 & 4). This study confirmed that a mean level could be reached in 30 minutes even in a narrow. Various regimes of working were tried and it was found that CO₂ concentrations could be maintained below toxic levels by opening an unoccupied tank out port for 10 minutes every 30 minutes. It was noted that the establishment of such a ventilating procedure might compromise the thermal insulation in a cold environment.

Conclusion

The protection of personnel against cold environments depends on a team effort. An assessment of the problems likely to be encountered in the worst possible conditions with clothing planning and training accordingly, is the most way of offsetting possible disaster. Protective clothing should be designed by a team which includes a textile chemist, a training expert, an ergonomist, a physiologist and an experienced representative of the eventual user. Prototypes should be thoroughly evaluated scientifically as well as in the field before general issue. Only in this way will we get truly basic adaptive equipment, produce the right lot for the job and in the long run, be cost-effective.

Acknowledgement

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1 The respondents selected the key domain activities that would be 5 major use of managers' resources of various departments. The survey is held long in the state of the company which is located the company has developed a management system based on the business model. The respondents are not in the knowledge of the state of the company and the state of the company is not known from the respondents.

medical teams and are available for transfer to any other supporting medical ships. Teams requiring support management or prolonged nursing care are transferred to the three hospitals of the Royal Fleet Auxiliary which provides the most suitable environment for the required team to perform its duties and tasks. Operating directly and continuously with medical support vessels the necessary military support.

The provision of a surgical capability allows the efficiency and flexibility of surgical support components on board hospital ships to be increased over those coming through of the more specialised principles, high level neurological and respiratory specialists. The deployment also provides an opportunity for specialists to operate away from the security of the hospital environment and thus provide valuable experience in planning for medical casualty contingencies.

General Practice (General)

Surgeon Commander R. Statham FRCS MRCP (Edinburgh) MB ChB

Surgeon Commander C. W. Miles MRB MS MRCS (London) FRCS (Edinburgh) FRCS

The Royal Fleet is responsible for the primary medical care in the overseas theatre of war. Such as, Lebanon, Hong Kong, and elsewhere, providing appropriate medical, dental and nursing facilities in these positions on complex on-call systems and guarantee medical care wherever that personnel and facilities enter in a new way of life as applicable to provide timely, quality care to the community in these areas, wherever they are.

These communities are made unique by a single factor: general practitioners (in general) do not usually operate and also in these areas. Within this being the official working language. The practices in Naples and Lebanon were the RFA's headquarters and provided a full range of primary medical care in an emergency/urgent setting, the team being led by an experienced single hospital general practitioner.

The other long island group practice of 1,000 patients is one which requires practice in the Royal Fleet being transferred by transfer to the Fleet Commander in Plymouth. Transfer to General Practice and is supported by the Royal Fleet's General Practice support team. The fact that the Fleet is a leader in general practice and the two principal medical officers are experienced generalists, each working one year in the practice before transferring to the Fleet. Medical Officers for health care and nursing. Because of the young patient population, there is no emphasis on the paediatric and geriatric care and a special doctor is allocated these duties.

The practice in Edinburgh, like Hong Kong, is a teaching unit but it has the distinction that the team leader, who is the Royal Fleet's only senior personnel involved with their community, whilst the Fleet is a General Practitioner, manages the day-to-day and then specialists. The two practice support have separate premises and therefore most of the teaching takes place outside regular surgery hours. The Royal Fleet's current plans are to do this year and have one of the principles of RFA's fleet there is a very close liaison between the three general practitioners and the staff in the Royal Fleet Hospital.

The reports give details of the type of work carried out in the various various positions and were necessarily abbreviated work sheets.

(1)

Discussion

Surgeon Commander P. A. Clarke FRCS MRCP (Edinburgh)

The paper describes how a Royal Fleet medical team, operating with assets away from the home and Royal Fleet bases, maintains the medical care of large numbers of the Fleet's front forces in positions for a period of three months, during the summer prior to the summer's deployment. The paper's potential complexity has medical officers and equipment. One in Edinburgh in January 1980 at 0100 hours. They were deployed in the late morning. The vessel's assembly given them many documents of Fleet's fleet's in the past.

The contents of one of these, Camp Fraser, was described. The medical team's deployment to support surgery and treatment in the summer of 1980 and typical fleet. Patients were primarily limited to 100 and patients were seen in the late evening hours during the day and night. Many of them were children who looked to the camp with a very wide range of diseases. In addition, the Fleet's front forces were required to provide care for the local community. The local community was largely in the form of a small, isolated community of people, some with serious chronic diseases.

Medical was particularly complex in the area and up to 100 cases of the local community. The Fleet's medical team, which the team usually planned for the day, and the medical team, was a team that sought a combination of the two, of a 100 patients.

Going to give and receive some medical services for the local community is a very complex and health care and in providing the medical care, which was given in the summer. These and patients thought to be in the Fleet, was found in a small number of the local community. The local community was found in the local community. The local community was found in the local community. The local community was found in the local community.

There was no doubt that the medical team was supported by both the Fleet's front and local community. The local community was found in the local community. The local community was found in the local community. The local community was found in the local community. The local community was found in the local community.

An outline of the medical team's work was provided in the Royal Medical Journal (1981, 10, 10).

References

Surgeon Commander P. A. Clarke FRCS MRCP (Edinburgh)

Since July 1977 there has been a requirement to provide a Fleet Hospital Team in Italy. The British Fleet, which has been in the Mediterranean for some time, has been under various names, and has been in the Mediterranean for some time. The British Fleet, which has been in the Mediterranean for some time, has been under various names, and has been in the Mediterranean for some time.

The Bacteriology of War Wounds*

I. B. Seligson

The most important aspect of the bacteriology of war wounds is the dynamic nature of the bacterial flora. On wounding bacteria are sucked into the wound from the patient's skin and surrounding environment and their colonization of the wound remains fairly static for up to 48 hours and only thereafter does multiplication of bacteria occur. The aerobic bacteria multiply more rapidly so they tend to predominate during this early period. However, after 48 hours the anaerobes begin to take over and by 72 hours they predominate.

Table 1 shows the typical findings from the First World War of the aerobic bacteria present in wounds about 12 hours after injury.¹ Of these bacteria, the main aerobic pathogens were hemolytic streptococci which were found in 14.7% of wounds. *Staphylococcus aureus* found in 13.9% and Diptheroidal bacilli 7.2%... some of which must have been *Corynebacterium diphtheriae*.

In addition to these aerobic bacteria anaerobes were frequently encountered, the main pathogens being clostridia and anaerobic streptococci. Incidence of clostridia of over 50% are recorded the proportion having a close correlation with the climate the highest frequency occurring in wet weather.

In the Second World War a very similar picture was seen and Table 2 shows the proportion of pathogens detected at times of

Table 1
The incidence of various aerobic bacteria in war wounds in World War I, averaging about 12 hours after wounding

Bacteria		Incidence	
		%	
Total		100	
Staphylococcus aureus	13.9	13.9	
Streptococcus hemolyticus	14.7	14.7	
Streptococcus pyogenes	1.1	1.1	
Staphylococcus epidermidis	1.1	1.1	
Staphylococcus saprophyticus	1.1	1.1	
Staphylococcus albus	1.1	1.1	
Staphylococcus citreus	1.1	1.1	
Staphylococcus carnosus	1.1	1.1	
Staphylococcus sciuri	1.1	1.1	
Staphylococcus hyacinthi	1.1	1.1	
Staphylococcus maltophilia	1.1	1.1	
Staphylococcus epidermidis	1.1	1.1	
Staphylococcus saprophyticus	1.1	1.1	
Staphylococcus albus	1.1	1.1	
Staphylococcus citreus	1.1	1.1	
Staphylococcus carnosus	1.1	1.1	
Staphylococcus sciuri	1.1	1.1	
Staphylococcus hyacinthi	1.1	1.1	
Staphylococcus maltophilia	1.1	1.1	

Table 2
Bacterial flora at times of emergency dressings and from amputations in World War II

Bacteria		Incidence	
		%	
Total		100	
Staphylococcus aureus	13.9	13.9	
Streptococcus hemolyticus	14.7	14.7	
Streptococcus pyogenes	1.1	1.1	
Staphylococcus epidermidis	1.1	1.1	
Staphylococcus saprophyticus	1.1	1.1	
Staphylococcus albus	1.1	1.1	
Staphylococcus citreus	1.1	1.1	
Staphylococcus carnosus	1.1	1.1	
Staphylococcus sciuri	1.1	1.1	
Staphylococcus hyacinthi	1.1	1.1	
Staphylococcus maltophilia	1.1	1.1	
Staphylococcus epidermidis	1.1	1.1	
Staphylococcus saprophyticus	1.1	1.1	
Staphylococcus albus	1.1	1.1	
Staphylococcus citreus	1.1	1.1	
Staphylococcus carnosus	1.1	1.1	
Staphylococcus sciuri	1.1	1.1	
Staphylococcus hyacinthi	1.1	1.1	
Staphylococcus maltophilia	1.1	1.1	

emergency dressings and from amputations in the Spring and Summer of 1944 and early Autumn of that year.² There was a much higher isolation rate of *Staph aureus* in this population than was encountered in the First World War.

Table 3 presents the bacterial flora at forward surgical centres and this shows a considerable increase in the proportion of pathogens isolated with clostridia. The higher proportion of 50% seen in the Spring and Summer of 1944 compared with

*Based on a paper presented at the First WHO/ICU Clinical Research Conference held at the University of Hong Kong July 27-31, 1954.

the Wound of Past year" was due to the fact that the former injuries were mostly Primary I trauma and the latter Primary II.

There are well known facts, and from the available facts of our present antibiotic policy (however, I must point out that none of the studies described has included any reference to *Bacteroides* species as pathogenic agents and this is because the technology available before the 1940s did not readily allow their culture. The only exception to this was the statement of Captain Alexander Fleming in 1923 to the Medical History of the Great War that the great neglected infections which could not be cultured were nevertheless important pathogens.⁴ He chaired the Medical Research Council Committee on War Wounds for having failed to mention them. Very little was said about *Bacteroides* until the 1940s when a number of studies showed that they were frequently encountered as pathogens, and in 1956 Moore presented evidence that they are the most frequent anaerobic pathogens isolated from pus.⁵ The primary importance of *Bacteroides fragilis*, the most common member of the species, stems from the fact that it usually produces an active fibrinolysin and also makes it not only resistant to penicillin, but prevents penicillin being active on other organisms which would otherwise be susceptible. Recently it is now frequently (up to 30%) resistant to tetracycline, the antibiotic that unknowningly was often used to treat it in the past. Thirdly, *Bacteroides* interferes with the normal phagocytic activity of polymorpho-nuclear leukocyte organisms as demonstrated by Lefkowitz et al⁶ and shown in Tables 4 and 5.

Thus, in considering the chemotherapy of war wounds, we must add this important species to our list of significant pathogens, particularly in those wounds which may be contaminated with fecal material or wounds contaminated with damage to the gastrointestinal tract.

TABLE 3
Bacterial flora of hospital acquired wounds in World War II

Organism	Number of isolates
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus epidermidis</i>	10
<i>Staphylococcus saprophyticus</i>	10
<i>Staphylococcus carnosus</i>	10
<i>Staphylococcus sciuri</i>	10
<i>Staphylococcus albus</i>	10
<i>Staphylococcus epidermidis</i>	10
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus aureus</i>	10

TABLE 4
The effect of *Bacteroides* on phagocytosis in the presence of penicillin

Organism	Number of isolates
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus epidermidis</i>	10
<i>Staphylococcus saprophyticus</i>	10
<i>Staphylococcus carnosus</i>	10
<i>Staphylococcus sciuri</i>	10
<i>Staphylococcus albus</i>	10
<i>Staphylococcus epidermidis</i>	10
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus aureus</i>	10

TABLE 5
Effect of various organisms on phagocytosis and killing of *P. aeruginosa*

Organism	Number of isolates
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus epidermidis</i>	10
<i>Staphylococcus saprophyticus</i>	10
<i>Staphylococcus carnosus</i>	10
<i>Staphylococcus sciuri</i>	10
<i>Staphylococcus albus</i>	10
<i>Staphylococcus epidermidis</i>	10
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus aureus</i>	10
<i>Staphylococcus aureus</i>	10

Surprisingly, wounds of the mouth are very seldom infected with *B. fragilis*.

Penicillin prevents the synthesis of chains against all the anaerobes except the *B. fragilis* group. Tetracycline is already mentioned, can no longer be ruled upon, and chloramphenicol has been shown to be relatively ineffective compared with the most bactericidal anaerobic agents. The choice for the *B. fragilis* group therefore is between clindamycin, metronidazole and cefoxitin, but I would thus like to consider the various parameters of their effectiveness in choosing between them.

three agents, the first consideration is their pharmacokinetics and consequently the plasma levels which may be achieved. Chlorthalidone has a half life of 3 hours, metronidazole a half life of 6-7 hours and cefotaxime a half life of 41 minutes. At the moment, the recommended frequency of administration is 3-hourly for chlorthalidone and metronidazole and 6-hourly for cefotaxime. These are very arbitrary clinical choices and only in chlorthalidone does a closely approximate normal pharmacokinetic rate that the frequency of administration should be at three times the half life of the agent concerned. It is evident that on this basis even 6-hourly cefotaxime is too infrequent and that a 12-hourly dosage for metronidazole should be adequate. The second point to remember is the relationship between the serum concentrations achieved with these different dosage regimens and the minimal inhibitory concentrations (MIC) of the pathogenic organism. The concentration of cefotaxime at which exceeds the MIC for 50% of strains of *B. jejuni* is 2 µg/ml for chlorthalidone 4 µg/ml for metronidazole and 32 µg/ml for cefotaxime. (Table 4). If a lower figure is selected for cefotaxime, such as 16 µg/ml then the growth of only 75% of strains of *B. jejuni* will be inhibited. The figure of 32 µg/ml is therefore not unduly high in considering the relationship between serum concentrations and MICs. It must be borne

in mind that the level of an agent within pus is usually lower than in the plasma. Consequently the peak serum concentration achieved should considerably exceed the MIC and it is generally agreed that the ideal minimum ratio between the peak serum level and the MIC is 4:1. Also the MIC should be maintained in the serum for at least 50% of the time between doses.

Considering the information set out in Table 4 it is seen that the maximum serum concentration achieved with chlorthalidone is 8.3 µg/ml which is 2.1 times the MIC of 2 µg/ml, and the concentration which is achieved for 50% of the time between doses is 4 µg/ml. Chlorthalidone is clearly an agent which nearly achieves the ideal and it therefore a potentially valuable agent. Metronidazole 500mg continuously achieves a peak serum level of 16 µg/ml which gives a ratio of 4:5 and the concentration maintained for 50% of the period between doses was 10.6 µg/ml which is well above the MIC of 4.0 µg/ml.

With cefotaxime the figures are most disturbing. The maximum serum level achieved with the 3g intramuscular dosage is 70 µg/ml which with an MIC requirement of 32 µg/ml gives a coverage ratio of only 1.25. The concentration in the serum two hours later is only 16 µg/ml which will only inhibit the growth of something as sensitive as 75% of strains of *B. jejuni*.

These figures support the suggestion that

Table 4
Optimally achieved serum levels of three antibiotics used against *B. jejuni*

Antibiotic	Dose	Route	Half-life (hrs)	Usual frequency	Peak serum concentration (µg/ml)	MIC of 50% of strains of <i>B. jejuni</i>	50% of times with maximum MIC of <i>B. jejuni</i>	Max. level maintained for 50% of time between doses
Chlorthalidone	500 mg	i.v.	3 h	3 hourly	8.3 µg/ml	2 µg/ml	4.2	2.1 µg/ml
	500 mg	i.v.	3 h	3 hourly	8.3 µg/ml	2 µg/ml	4.2	4.2 µg/ml
Metronidazole	500 mg	i.v.	6-7 h	3 hourly	16 µg/ml	4 µg/ml	4.0	10.6 µg/ml
	500 mg	i.v.	6-7 h	3 hourly	16 µg/ml	4 µg/ml	4.0	10.6 µg/ml
Cefotaxime	3 g	i.m.	41 min	6 hourly	70 µg/ml	32 µg/ml	2.2	16 µg/ml
	3 g	i.m.	41 min	6 hourly	70 µg/ml	32 µg/ml	2.2	16 µg/ml

the design of microtechnique recommended at the moment is uncertain and that more microtechnique is being given to patients than is necessary. From information available on serum levels, but not yet published, it is possible to recommend at least a 12 hourly course than an 8 hourly schedule.

Another factor which needs to be taken into account in choosing a therapeutic agent is its bactericidal activity. When a cooked meat medium broth culture of *S. pyogenes* containing approximately 10^8 organisms/ml was inoculated with 40 $\mu\text{g/ml}$ streptodactin, the viable bacterial count rapidly fell so that 4 hours later only 10^2 viable bacilli remained, and by 6 hours the culture was for practical purposes sterile (Fig. 1). Using 5 $\mu\text{g/ml}$ clindamycin, I took more than 6 hours before any appreciable killing effect was seen, complete eradication of cultures of *S. melanosanguineus* occurred after 20 hours but with *S. pyogenes* killing was incomplete and just over 10^5 viable organisms/ml remained even after 48 hours. Thus, clindamycin, though an active agent in terms of its bacteriostatic activity, is less attractive when seen in terms of its bactericidal activity. In some clinical situations such as septicemia or cerebral abscess, delayed bactericidal action for 24 to 36 hours could be important and this would explain some clinical observations. In subpyogenic cultures in the same kind of medium, we first applied a series of Klebsiella with an MIC of 4 $\mu\text{g/ml}$ and a minimum bactericidal concentration (MBC) of 16 $\mu\text{g/ml}$. As shown in Figure 2, when 10^8 organisms/ml in liquid medium cultures were exposed to a concentration of rifampin of 8 $\mu\text{g/ml}$, there was a slight reduction in the viable count by 6 hours and then subsequent regrowth. Concentrations of rifampin of 16, 32 or 64 $\mu\text{g/ml}$ produced more rapid and equal killing with eradication of the cultures by 24 hours. This is clear evidence that rifampin in these systems of 16 $\mu\text{g/ml}$ or more is a good

bactericidal agent for Klebsiella. This supports the validity of this test system. The experiment was then carried out on the about viridans of *S. pyogenes*, which has an MIC of 4 $\mu\text{g/ml}$ but an MBC of 8 $\mu\text{g/ml}$. As shown in Figure 3, the viable count of 10^8 was inhibited by rifampin 8 $\mu\text{g/ml}$ only slightly in 2 x 10^6 per ml and by 16, 32 and 64 $\mu\text{g/ml}$ to between 10^2 and 10^3 per ml. The 10 $\mu\text{g/ml}$ microtechnique control, was unacceptably produced nearly culture by 6



Fig. 1 Effect on *S. pyogenes* viability of streptodactin and clindamycin.



Fig. 2 Bactericidal activity of rifampin against Klebsiella. MIC = 4 $\mu\text{g/ml}$; MBC = 16 $\mu\text{g/ml}$.



Fig. 3. Haemorrhagic activity of plasma at 100% and 50% against time. Δ 100% (ABC) \circ 50% (ABC) \times 100% (BC).

hours. In a number of experiments over 48 hours it was found that with up to 18 μ g/ml of celestane there was subsequent regression of symptoms after the initial reduction (Fig. 4). This regression could be due either to the development of resistance to celestane or to its degradation over the prolonged period. In conclusion there is complete agreement in all three treatments that metamizolol is clearly the most haemorrhagic agent of low choice against the *Rattus norvegicus* species. Celestane is effective but the agent of second choice. Celestane is of very doubtful value and cannot be considered as a variable agent for these selections.

In terms of the arbitrary situation I would like to suggest that a metamizolol with a metamizolol be administered at the cut level point of media above to all was used unless as shown the metamizolol test may have been potentiated. This could possibly allow the safe period between assay



Fig. 4. Haemorrhagic activity of plasma at 100% and 50% against time. Δ 100% (ABC) \circ 50% (ABC) \times 100% (BC).

and surgery to be extended perhaps to 24 hours or even 48 hours and to allow a more rational use of medical services and provision for surgery.

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Gardner's Syndrome: A Case Report

J. W. Ballard

Abstract

A patient suffering from Gardner's Syndrome is presented. His clinical features are described and the importance of early diagnosis discussed.

Introduction

In 1946 Eldon Gardner commenced a study to investigate whether polyposis of the colon manifested any periodic significance in relation to the syndrome and in 1950 reported a family with an unusually high incidence of carcinoma of the alimentary tract.¹ Forty-five members of one family were studied of whom nine died from gastrointestinal carcinoma, mostly in the large bowel and rectum. A subsequent study of the surviving members of this same family revealed that five had polyposis of the colon, two of whom had well established carcinoma.² With 'Pilaris' and 'Richard' Gardner described the syndrome which now includes an association of polyposis of the colon, multiple osteomas and cutaneous fibromas or epidermal cysts. He demonstrated the autosomal dominant, non sex linked pattern of inheritance.

A patient suffering from multiple osteomas, multiple osteomas, rhinoidal nasal polyps and polyps of the colon had been described in 1943 by Ringstead.³ However he believed that this was a variation of von Recklinghausen's disease (neurofibromatosis). The syndrome has been referred to as the Fitz-Jung-Gardner syndrome in the dental literature but probably more correctly as Gardner's syndrome in the medical literature. Early recognition of the

syndrome is important because of the precancerous nature of the colonic polyps. The other features of the syndrome are clinically more obvious but may be

Case Report

A 31 year old Royal Naval rating was referred by his dental officer to the Department of Oral Surgery in the Royal Naval Hospital, Haslar. He had noticed a lump in his palate one week previously and he felt this was becoming larger. Also he had been aware for the previous two years of a hard lump on the lower border of his mandible in line of the angle on the right side which had increased in size for a year and then remained static. Another lump had occurred here very soon.

On examination no swelling was visible but a hard irregular nodule the size of a large pea could be palpated on the inner surface of the right lower border of the mandible anterior to the angle. A smaller nodule was palpable on a similar position on the left side of the mandible.

The patient had good dentition except 2/4 which was missing. There was a hard swelling 15 mm by 10 mm in the molar region of the right side of his hard palate. The overlying mucosa appeared normal. The bone of the mandible in the buccal sulcus was irregular and bumpy quite unlike normal smooth alveolar bone.

Radiographs showed the hard nodules in the alveolar and in the bone of the mandible there were areas of partly fluffy

ulcerous with two small dentations in the right lower canine region (Fig 1). *A* was marginated.



Fig 1. Ulcer of gingiva with dentations adjacent to *A*3.

This patient had been seen in the dental department five years previously when retained deciduous teeth and *A*4 had been extracted to allow *A*3 to erupt into the arch. An orthopantomogram taken at this time was available for comparison with the current radiographs (Fig 2). The overall bone pattern was unchanged but in the intervening years the two molars had drifted in line. *A*3 had not moved despite the space created for it.

Upper dental and skull radiographs showed the presence of additional unerupted teeth in the frontal, maxillary and mandibular areas (Fig 3).

The palatal maxilla was removed under general anaesthesia after exposure through an incision in the overlying mucous membrane.

The patient was referred to the gastroenterology department for gastroscopy to exclude Gardner's syndrome. A rectal polyp was removed and the histological report described this as a completely mixed tubulovillous adenoma of large bowel with moderate epithelial dysplasia consistent with Gardner's Syndrome. Multiple small polyps were found on the colon on colonoscopy confirming the diagnosis (Fig 4). The premalignant nature of this condition was explained to the patient and a total colectomy with ileo rectal anastomosis



Fig 2. Orthopantomogram of the patient.



Fig 3. Skull radiograph showing unerupted teeth in the frontal, maxillary and mandibular areas.



Fig 4. Colon with multiple polyps with ileo rectal anastomosis.

was performed. He made an uncomplicated recovery.

All members of the immediate family of this patient have been investigated but none has been found to be similarly affected.

Discussion

Most of the patients with Gardner's Syndrome reported in the literature have been from North America. Only three patients have previously been reported in the British literature:^{1,11} Gorlin and Chandley¹ reviewed the literature in 1960 and suggested that the underlying cause is a congenital tissue disorder. Mayne¹¹ examined the incidence of Gardner's Syndrome in twins (than one pair in three).

Characteristic manifestations in addition to the classic triad have been reported and these have been summarized by Jones and Corneli.¹² Soft tissue lesions may include fibromas, sebaceous cysts, hemangiomas, keloids, neuromas, dermoids and epidermoids and mesenchymal and mesodermal fibrous tumours. Bony lesions occur throughout the skeleton and range from frank osteomas to small areas of subperiosteal bone deposition on the long bones. The characteristic sites for osteomas are the mandible, maxilla and frontal bone.

The dental manifestations were first reported by Fuder et al in 1961.¹³ The abnormalities most frequently found are multiple odontomas and multiple impacted supernumerary and permanent teeth.

Gorlin and Chandley¹ observed that the earliest manifestations of this syndrome appear about puberty and usually precede the polyposis by some years. Gattner and Perle found the ages of those fully affected in the family they investigated to range between 14 and 45 years and even listed evidence of early exposure with no polyposis in a ten year old child.¹⁴ The mean age at diagnosis is 34 years, which may represent a considerable delay in diagnosis. In most

patients it was the symptoms from the polyposis which led to the diagnosis although plainly visible osteomas and soft tissue tumours had often been present for years without apparently causing alarm.

Because of the known propensity for malignant change, most surgeons advise colonoscopy at once in the diagnosis of polyposis as recommended. MacDonald et al¹⁵ proposed that 100 per cent of these patients will die of evidence of several colitomas before the age of 50 if colonoscopy is not performed.¹⁶

The earliest features of the syndrome are most likely to present to dental practitioners as in this case where multiple osteomas were associated with unerupted teeth and crowds. As a first stage the buccal tissue investigation has the characteristic appearance of polyposis but as the teeth erupt the polyps may be too small to be seen and there is the risk of a false negative report. Where the histology gives a report to negative this should be repeated at six monthly intervals. Colonoscopy, which was performed in this case, demonstrates the polyps by direct vision however small and enables the diagnosis to be made far earlier than was possible previously.

Patients who have no family history and where no other member of the family is found to be similarly affected are presumably the result of a mutation. Delaney et al have reported one other such patient.¹ Early diagnosis enables the patient to receive genetic counselling thereby preventing generations of suffering as was discovered in the family investigated by Gardner where the disease was known as the "Family Curse".¹⁷

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Mediterranean Memories¹

D. P. GORD

And so in March 1917 we left Southampton in a troopship, bound for the Middle East. We knew I think that something was about which was likely to lead to confrontation with Germany but we did not take any serious account of it at that time. The troopship carried a large number of Royal Air Force officers who were proceeding to the Middle East. Among them was an RAF dental flight lieutenant who had been a student with me. He was a shy and shrewdly man with whom I had not come into very close contact before. He had been a North of Ireland aristocrat which he could attest in the best details with extraordinary expertise. I wish I had some recollections of those men as I feel they would have filled a place in local literature. On the day before we arrived in Malta he came to my cabin while I was shaving, and related another story which had just come to his mind and before he parted he said that he was extremely glad to have renewed our acquaintance as he had seldom met a man with the command of Northern Irish literature that I had!

When we called at Gibraltar a young RASC lieutenant related joined us. He had been in charge of the Military Hospital at Gibraltar and was now proceeding to Malta to take over the Military Hospital at Malta. We quickly became good friends and he asked me to make sure that I called upon him when we arrived at Malta. This

recollection was to become closer than I anticipated for during part of the war I was posted from the Royal Naval Hospital in the Military Hospital at Malta under his command. We formed a friendship which lasted for many years until his death.

We arrived in Grand Harbour, Malta, in the evening and I was taken to the Royal Naval Hospital where I was received in the standard way by the three officers who were to be my commanders there. All three were about 40 years my senior but the courtesy and consideration with which they received me and the extreme personalisation which they showed to ensure that we arrived had everything ready and would look after us properly are memories that will always return with me.

The Royal Naval Hospital at Malta was then a very beautiful place. It had been chosen by Lord Nelson in the early days of French occupation with the understanding that a suitable site for a hospital and the entire portion of the hospital had been the palace of a Count De La. Two wings were added to this palace, in a most beautiful way so as to preserve the beauty of the original architecture and the hospital grounds were kept in excellent order. There were lawns with roses growing on them, flowers and shrubs and a general air of perfection.

The medical staff consisted of a Surgeon Rear Admiral, a Surgeon Captain, five medical officers, two dental officers, and a Physician Commander. There was also a Warrant Wardenmaster and, as I feel sure is bound to do, I remained in my own mind

¹Former introduction appeared in *Nile* 1726 and 1813.

the persuasions of the individuals and came to the conclusion that it was of most importance that my relationship with the Western Mediterranean should be both close and friendly. As time went on this chance proved to be absolutely invaluable. He was a man who in appearance rather resembled the film actor Wallace Berry. His knowledge of naval law and regulations was profound and he, naturally, could not have been surprised. The Surgeon Rear Admiral was a man of a very winning disposition. In contrast, the Surgeon Captain I had been married was a rather stern individual with a strong sense of discipline. I soon became aware of this and also of the fact that his experienced, unflinching, remarkable changes periods of extreme stability and kindness alternating with severity and withdrawal. I was becoming very conscious of these swings of mood and learned to adjust my conduct accordingly.

The five medical officers were most compatible colleagues whose friendliness and helpfulness could not have been surpassed. The two dental officers were also most friendly and good-humoured. In those days most hospital medical officers were two-in-one. The radiologist was also the anaesthetist. The surgical specialist did the ENT work as well as orthopaedics while the pathologist looked after the sprays with concerning patients suffering from infective diseases and other infectious diseases. The neurologist was also the assistant surgeon while I found that I gradually became assistant anaesthetist as I had had very considerable experience in this specialty at a home hospital — it was before the days when anaesthetists had become a specialty in its own right and in hospital day doctors evidently gave the anaesthetist the anæsthetic operation in the absence of the honorary anaesthetist. The laboratory used as indoor anaesthetics were limited and primitive compared to the wonderful anaesthetics available today but was

developed a certain speed and saved a great deal of time for the subject.

The ophthalmic department was housed in a delightful suite of rooms which had both the dining room and entrance of the Grand Hotel when he occupied the palace. I had access to a verandah from which I could enjoy a panoramic view of Grand Harbour which was almost always full with the ships of the Mediterranean Fleet. The battleship *Warspite*, the battleship *Rene* and *Agincourt* as well as several Caring class cruisers were usually anchored there and ported boats ran to and fro between the wharves. The flag of several Flag Officers was always visible and those which the neighbouring harbours at Malta and Alexandria contained the dockyards, the administration and a major city. The Vice Admiral Malta flew his flag in the extension of St. Angelo across the creek from the hospital and the main, surroundings were not only historic but very beautiful.

My pleasure in my new situation was greatly increased by some body handing me a copy of the *Daily Mirror* which contained an item from about the leadership of the war making a merry dash from the Germans with a patient who had sustained a severe eye injury. It dawned on me as a chilling warning that the battleship was actually docking from the Germans in Malta for my surprise. The Surgeon Captain had been an ophthalmic specialist in our last days and I approached him about this surprising problem. He told me to get on with it as that was what I was paid for from which afterwards I drew but little comfort. In due course the *Warspite* arrived at Grand Harbour and the patient was brought to the hospital. The notes accompanying him related that he had been injured in some way at Piræ and had been treated by an eye surgeon there. The notes suggested that there was a foreign body in the anterior chamber which had been subjected to various attempts at removal. The result of

this was that the corpse was considerably spoiled and it was not possible to see the contents with any degree of accuracy. A rape revealed no corroborative things body as the eye or when I had heard that Mike possessed a very good real opthalmic virginia I telephoned him and arranged to take the patient to see him at the civil hospital in Helsinki. I put the patient in my car and drove to the hospital to be greeted by Professor Puumala with great kindness. This was the beginning of a lifelong friendship with him and his family. The civil hospital possessed a hot lamp microscope and when we examined the patient together it was quite obvious that he had had previous attacks of virus and that the lesion body mentioned in the notes was actually a squamous which had become detached and fallen into the angle of the anterior chamber. Treatment of the virus quickly cleared the matter and the patient made a good recovery. On questioning him it was apparent that he had had several attacks of virus in the same eye.

The next interruption to the harmony of my contentment occurred when a destroyer captain reported the loss of that one of his crew had been accidentally drowned and he asked the body to be transported to the hospital and placed in the mortuary prior to burial. I wanted to know time for everything to happen and eventually after midnight I turned to having given instructions to the night duty staff regarding the reception of the remains and suitable placing in the mortuary. Next morning I visited the mortuary to ensure that the body had actually arrived and regarded my own participation in being at the end. This was notice for the next development was a letter of complaint from the destroyer captain regarding delay in obtaining a boat to convey the remains to the hospital, the refusal of the hospital police to allow the use of the car lift, and the severe effect which the matter had had upon the morale of the

ship's company as they were obliged to carry the body on a stretcher up the hospital steps where they were received by a leading sick berth attendant. The captain obviously felt that he had been slighted in some way. The Surgeon Rear Admiral said for me and told me that this was really quite a serious matter which discomfited me some slightly although I was unable to see where the truth of this lay. It was then that my friend the Warsaw Warden came to my aid. He told me that the delay in obtaining a boat had nothing to do with us but was the responsibility of H&H in Ångström. Secondly, the refusal of the hospital police to allow the use of the car lift was absolutely correct in the regulations for us, we did not violate the carrying of dead bodies and so long as the policeman was not so aware that death had not been due to some infectious or contagious disease. The reception of the body in the mortuary was not my concern, he told me, as my business was with the spirit and not with the dead. It is fortunate then at this time we had a change of H&Hs and the new one wrote a letter to the captain of the destroyer in exactly the terms suggested by the Warsaw Warden with no addition to the effect that had the body been suitably received by the Union Jack in accordance with King's Regulations and Admiralty Instructions no breach of decorum would have occurred. The captain of the destroyer then asked for the return of the claims in which the body had been wound and the Surgeon Rear Admiral replied that these had been destroyed in accord with the normal hygiene principles. Nothing more was heard of this matter.

I had been given introductions to certain Helsinki friends by a friend in the Naval Medical Service who was also a native of the island. I found their company and hospitality absolutely delightful but my association with young Helsinki ladies was somewhat frowned upon by certain persons in social circles. I did not take too much

months, I did so for I was young and very happy.

The Mistake, soon occurred and was chiefly very very much on the human line in the midst of many there was a temporary misop. One of my patients, a Paymaster Lieutenant was very interested in languages and as there had always been a hobby of mine he asked me to visit his home to meet a young lady who was helping to improve her Spanish. I went as desired at his flat in Valencia and having met the lady was quite sure that this was the one. Fortunately she seemed to have the same idea and we duly became engaged within a very short time.

The course of life was further disrupted by my being informed that I would have to proceed to Alexandria shortly to join the hospital ship *Minerva* for a period. I could not see the reason for this as the *Minerva* already bore an established reputation, but there is no reasoning with authority. The *Minerva* had been a gift to the Royal Navy by the ladies of Malta in the United States for the purpose of tending the wounded during an earlier war and when one considered that she was the one hospital ship of the greatest size on earth she was certainly most appropriate. One feature which I do remember was that the accommodation on the land operated left was arranged in such a way that a stretcher could only be placed in its strictly designed position so that it was extremely difficult to introduce it at the higher level. The canteens were small, badly ventilated and heated with gas. On one occasion one of these caused my central auditory system and using my canteen, causing an agony the like of which I have never had to endure before or since. Fortunately the ENT specialists occupied the next cabin and was able to introduce some form of analgesia which allowed me sufficiently to enable me to sleep.

The ship had a Merchant Seaman Captain and crew. The sailors were merchant seamen and entirely Maltese. The senior

officer of the medical team was a Surgeon Captain and it was quite natural that he and the Maltese should be somewhat poorly placed regarding authority in that dispute occurred regarding who did what and why. The differentiation between the executive masters role and that of the medical officer at all times was very delicate indeed. It was therefore most important that such apparent frictions should involve officers of a congenial disposition but this was not always possible and on one occasion some years later when I started the ship to have a longer with the Captain, my colleague on board would not speak to me.

The overall senior officer was an Alexandria and her flag personnel were ashore to live under orders at a place called Solihah. Each of us younger medical officers had to live there in tents or provide general practitioners served in the *Minerva* personnel. It was an interesting experience living in a tent in the desert and the one which was very close by was close and delighted me immensely. The beds were bare, who looked after us were remarkably efficient, friendly and energetic at all times. I have not been to Alexandria since but it was then a very unimpressive city with large colonies of Cypriots and other nationalities in business and the professions. The situation of course is marvellous with a very large exposure to the sea. There were some excellent hotels and we frequented the night clubs a great deal. In the *Minerva* we used to operate on our patients sitting in the theatre so dressed and then putting on our gowns. One morning following a post-operative patient right at one of the night clubs when several of us had dined upon the stage in the great delight of the audience. I was standing at the back and in my opinion having a beautiful after helping in the operating theatre when a chap came with a midshipman at the helm arrived in the gangway. The midshipman asked to see me and explained me that he had been sent

by his captain to tell me how much he had enjoyed my show on the night club the night before!

My husband managed to get a passage to a merchant ship from Malmö to Alexandria. I obtained a flat for her and in this house we were married. First at the Swedish Consulate Church and later at St Mark's Church on Mohammed Ah Square. Then, as Hider had just invaded Poland, it was necessary to arrange for my wife's return to Malmö so, to my great delight, I had received a signal that my presence at the naval hospital was more more required. We managed to get a passage for her to a small tramp steamer carrying a cargo of sugar from Alexandria to Malmö and I set out a few days later on the tugboat *Proctor*, arriving just after my wife. We rented a new villa in Malmö as a very reasonably rent and despite the war with Germany we were gloriously happy.

The war began to go badly for Britain and Germany, that Malmö would be various. Malmö ended the conflict on the German side. The day after the declaration Italian planes appeared over Malmö and air raid warnings were heard for the first time. We did not know what to expect but after a time we realised that the Italian planes were not particularly dangerous. We had on the island at that time three rather ancient fighters, seaplanes named Jack Hope and Clancy. It is almost incredible to think that we used to discuss the progress of the war with our own pilots in the evenings, rather in the manner that one discusses a football match on the preceding afternoon, making such remarks as: "We thought you did fine, George, when you chased Hammer Dangle."

It was eventually decided to evacuate the patients from the Naval Hospital to the Military Hospital at Malmö soon this was not such a strange decision. Shortly before this, I was doing a night round of the almost empty wards accompanied by a leading sick berth attendant. While

chatting to a member of the sick berth staff who was almost blind in a ward suffering from an ear complaint, I heard a noise which I thought was gunfire. I told the leading sick berth staff that we had better get the patients to the ground floor and also go there ourselves as there was no one else in that block. Thus we proceeded to do so and while we were working along the corridor there was an amazing explosion. When I came to, I found myself covered by a dose and a certain amount of rubble. My companion I never saw again. It took me about three weeks to recover from this experience during which time my speech had become unusually incoherent and slow and despite great efforts I was quite unable to walk faster than at a certain pace. I was treated in a ward which contained the hospital's main supply and it was interesting to walk up each morning and gaze upon these symbols of warlike life.

By this time the Germans had become satisfied in attacking Malmö and when the seventh carrier *Affenkuur* landed in after being severely damaged by the Luftwaffe off the island of Færöarna, the Germans bombed Malmö night and day. As the dockyard was only about 200 yards from the hospital the atmosphere was very noisy with German dive bombers screaming in and over and around you in Malmö opening up. I was in a remarkable bed at this time my wife and I were accommodated in an empty ward corner and the ward below was used for the disposition of the dead from the search rooms while I was chosen to be the officer who should, as far as possible, identify about 600 damaged photographs. I did this in two instalments of four hours each after which the remains were taken to sea for mass burial.

Very soon after this we left for the Military Hospital at Malmö and I was fortunate enough to obtain a room in an hotel which my wife and I had used before and which was a short distance from the

hospital. Between the band and the hospital there was an airfield where our light aircraft were kept and I used to cycle swiftly past this area between raids but we never actually caught by any of them.

My symptoms at the Military Hospital by my friend the Colonel were very severe. He told me that I must relax as things did not seem so bad in the Army as they seemed to do in the Navy, and that the only two urgent matters in military circles were fire and darkness. We also told me that for my general health and efficiency I must have a long weekend off every month, from Friday afternoon until Tuesday morning, a fact which I pursued with considerable pleasure for only a short time before, following an unobtainable attendance on duty at the naval hospital, I had applied for a Society off. The Surgeon Captain, after looking me in the eye for what seemed to be two or three minutes, said that I could have most that week but not to make a habit of it.

We set up the ophthalmic department at Mafik in good time. Our patients were principally Maltese soldiers, most of whom were blind, some blind. Their first line of defence was in their very knowledge of the English language and also in movement that they were quite efficient. We had made a few casts with materials on end of letters so we knew that most of the patients were engaged in business of some kind. On one occasion my Leading SRA checked the vision of a soldier's right eye using the materials as the soldier had provided his strategy. He then covered the right eye and exclaimed 'I've heard of letters in the left eye and the priest taught the letters quite well. The Leading SRA then said to me "This would be a good one for a portrait or 'The left eye is busy with the right eye is colouring!'

There were about ten naval medical officers in the medical officers' room at Mafik and we fitted in extremely well. It was a very happy time. Many of the RANM

officers were somewhere from various parts of the British Isles. The hospital had been promoted from a Military to a General Hospital and the assets that all the military personnel got during promotion. Such bonuses were not for us, however, and I found myself visiting officers who a few weeks ago had been visiting me.

Night duty was quite exciting because the Ta Qali compound was only about two miles away and the Germans took a great interest in it. I did my night duty in the Colonel's office, lying down from time to time as an emergency but I had conversations with a half-wit on the staff who became informed of the position of the animals and occasionally he would insist that you was approaching very fast, after which there would be silence until we heard the stamp of the hooves. Then he would come back and tell me where to drag the bombs and usually follow. Except on occasion, the hospital remained remarkably unexcited and was only hit on a minor way on two or three occasions. There were shells within the hospital but not far out of the hospital grounds there also happened to be a series of small caves. We had three or four British prisoners of war in the hospital who shared with a little gardening and were very sensible. They were guarded by numerous Maltese soldiers with fixed bayonets and at night when the air raids got bad, it was interesting to see the Maltese soldiers jumping mountains and other acts of holding while the prisoners of war followed them carrying the rifles. Every morning large numbers of prisoners were brought before the Colonel for inspecting the animal caves, which were out of bounds. However, I don't think that their punishment was particularly severe.

My wife, being a good linguist, was at the time employed by the Conscription Department in Valletta. She said that she would prefer me to come down and live in the capital so it was easier for work and she

did not like going close between her office and the bed. We took a small flat in what is now South Street in Yafaletta and the room was crowded with heavy German furniture most. The flat was not on the ground floor but having some steps to an inner shelter, we decided that nothing was better than that and we would go to bed on the second floor and leave it that to be on the first floor. It is remarkable how one can accustom oneself to sleep through bombing and heavy gunfire. One of my last recollections of my time in Malta was seeing a British child walking along the pavement reading a story, during quite a severe German raid on Valletta.

My relief had now arrived on the island and, having been truly kind to me for four years, it was time for me to return. The Vice Admiral Michie refused permission for my wife and I to go by sea because it was too dangerous, and we were on the ground left in Egypt by the RAF. Thus we ended our time there and day after day I went to the office of the Singapore Leader in charge of three flights, only to be met with a postponement. Eventually an Army chaplain told me of an officer whose family had been flown to Cairo for a break. Armed with this information, I approached the Singapore Leader in a rather confident frame of mind, giving him the names of the individuals and the circumstances under which they had been flown out, and reminding him that I was proceeding home on duty.

And so we went one evening to Long Airport and down into the operations department which was a deeply underground. There we waited our flight to Cairo while the Germans bombed the island with considerable vigour. Eventually we emerged and were brought up the tail of a Wellington bomber with our two or three comrades. We flew along the North African coast, then under German control and despite being fired on from time to time, we duly arrived in Cairo. We were

accommodated in an excellent hotel. The officer in charge of the department had been in the prisoner-of-war force and had spent the interval prior to his recall as a gear operator at Cairo so that he certainly knew what he was doing. I told the joys of the Germans to my wife and spent much time on at the Ophthalmic Hospital at Heliopolis on the Nile. The chief surgeon was an old Moorish man and had a most exceptional knowledge of ophthalmology in that he seemed to have a photographic memory, recalling with great ease everything he had ever read or seen. He did some surgery for my children and visited me in my flat in the evening at his home where he saw his private patients. It was customary to start work very early in the morning and to continue until one o'clock. The period from two in the afternoon until about six pm was reserved to the needs but after that work began again and continued until midnight.

The clinic was remarkable in that it was more like a club than a clinic, with patients walking about, chatting with one another and also with the surgeon, with whom they discussed the treatment to be applying to other patients. When they read of this, a note was put inside where they could play various table games. *At about midday* the surgeon began to operate and, having several beds, he was able to keep the patients for a few days until any danger of post-operative catastrophe had passed. It was an interesting example of a professional practice which must have been quite liberal by and which was certainly conducted with great skill.

After a fortnight's stay in Cairo we proceeded to Dakhla in a aeroplane. The aeroplane was greatly overcrowded and very confined in every way. On board was a group of German prisoners, including a general, who had been captured at Tobruk. I was asked to act as interpreter for these prisoners and also to look after their medical welfare. In order to reach them I

had to pass above these guard posts but I discovered that I could also reach them by another route which did not involve passing any guards at all. Shortly after this a cache of weapons was discovered and it was quite clear that they had intended to take over the ship. Fortunately the attempts were foiled and on arrival at Durban they were discharged from the ship and taken to a prisoner-of-war camp.

Our fortnight's sojourn at Durban was spent in a most pleasant hotel and we were very impressed by our first visit to South Africa. We were also delighted that we were not going any further as that particular escapade had been transferred to the luxury liner *Monarch of Bermuda* which had just been requisitioned as a troopship. She had not been damaged in any way so that the fitness and readiness were complete. In this vessel we proceeded to Cape Town where we had another few days' sojourn before leaving for Swetstone and Liverpool. Cape Town is a marvellous city and I very much regret not having had the opportunity to spend a considerable amount of time there.

The ship reached Freetown without any stress although we did pick up some

people who had been together a day or two before. Eventually we arrived at Liverpool, a city I had once known very well but in which I now felt quite lost because the landmarks upon which one had depended for bearings had all been completely changed. The Adelphi Hotel was still where it had always been and in this we appeared to be treated with particular courtesy and efficiency.

I was allowed two weeks off duty which after four years' absence did not seem to me to be excessive and was then asked to act as ophthalmic surgeon at the Admiralty Medical Board inasmuch there wanted to go on leave. On being asked what appointment I would like I opted for the post of ophthalmic surgeon at the Royal Naval Auxiliary Hospital at Swetstone, near Bristol. This was situated in a beautiful part of the countryside and although it had a very large wing devoted to psychiatry, there was also an extensive general hospital with top ranking consultants in medicine and surgery. So with a view to continuing to take some higher medical qualifications I was delighted to be appointed to this post.

To be continued

LETTERS TO THE EDITOR

3a.

I read with interest the leading article in the September 1981 *Lancet* entitled *Special problems presenting as an acute NSAP*. British Polioevidance praised the satisfactory management of the 29 patients presenting with acute abdominal pain as a tribute to the quality and training of Polioevidance medical officers, who are usually on their post irrespective of appointment with only modest diagnostic and surgical experience.

Concern was expressed about the accuracy of diagnosis during the presence of a medical officer. No medical officer is carried on SSNs and on other days the first Lieutenant is linked with health care after attending a short medical course.

The US Navy has become concerned about the accuracy of diagnosis for the most common multiple surgical problem — acute abdominal pain. Because they cannot staff most of their SSNs with medical officers, they have issued medical instructions to a higher standard. To improve the diagnostic accuracy for acute abdominal pain the USN explored computer-aided diagnosis (CAD) using a programme developed by Mr F. T. de Dondert in Leiden.¹¹ Using a standard medical audit for history and clinical findings to assess the diagnostic accuracy could be improved from 55% to 77%. When the same data was fed to a computer programmed for acute abdominal pain, the diagnostic accuracy was further improved by 10%, to 78% (88%).¹² The programme was written at BASC and required only 88

BASc which was available, no spare capacity, in the computers already installed in US SSNs.¹³

The Alameda CAD project showed that when doctors were familiar with the programme their diagnostic accuracy improved. Unnecessary negative laparotomies were reduced, as was the number of special investigations required to support the acute abdominal diagnosis. Patients with non-specific abdominal pain (NSAP) were discharged from hospital earlier.¹⁴ As a consequence of that project, the Department of Health & Social Security is its sponsor, an acute project on regional hospitals.

De Dondert reviewed the diagnoses for 4877 general surgical patients presenting with abdominal pain and found 41% had NSAP. It is interesting to compare his gross diagnosis with the high number of diagnoses of acute appendicitis made by the SSN medical officers. Although this was a highly younger and fitter population there is a real chance of any patient with NSAP (Table 1 & 2).

McMahon followed up 141 patients diagnosed as NSAP for a period of one year and found 70% had no further problems. Of the remaining 30%, 70% were managed by their GPs with diagnoses ranging from dietary problems to functional disorders. Only 12 patients were re-admitted with further attacks of NSAP. These had negative laparotomies and only one had acute appendicitis.

McMahon concluded that whenever the

THE ROYAL NAVY MEDICAL CLUB DINNER 1981

The annual dinner of the Royal Navy Medical Club is held in the Grand Hall Royal Naval College, Greenwich on Friday, September 11, 1981.

The President, Surgeon Vice Admiral J. A. R. Harrison OBE FRCS made the following speech.

First Sea Lord official guests, personal guests and members of the Royal Navy Medical Club—I welcome you all once more to this building built for our annual dinner.

Our principal guest tonight is Admiral Sir Henry Lamb, Chief of Naval Staff and First Sea Lord — or in the simpler terms of Admiral Latham's daughter, the Navy's gaffer. His predecessor Admiral Lemon believed in naval medical care for naval families and Admiral Lamb approaches the need for medical provision in the Royal Medical Service. Admiral Lamb is well qualified to be the professional head of the Navy. He must be one of the few officers still serving with a conscience and experience in despatches, crises and battleships in World War II. Needless to say he has had massive sea command and Ministry of Defence experience since those days. It is a pleasure to have him with us tonight and to have him tonight for us and to us tonight.

As Chief Marshal Sir David Evans does with us for the first time. He flew as a pilot in Europe at the end of the Second World War. He comes to his present appointment as Vice Chief of Defence Staff in charge of personnel and logistics with an immense reputation from RAF Strike Command. Sir David was in a fleet ship holding his seat in the

World Championships, and certainly personnel and logistics — on a pretty steep slope at this moment. But obviously he has steering skills and a steady nerve. We usually meet across a table, and it is a treat to have him alongside our tonight.

Admiral Sir Desmond Canham is with us for the third year in succession — almost a member of the Club. It is good to have our boss with us at dinner to thank for his support.

Sir Arthur Hinchley dines with us tonight. I think for the first time. Although his first appointment was to the Admiralty as Second Permanent Under Secretary in the Ministry of Defence. Sir Arthur will know the constraints affecting needs of the three Services and their medical services. He fits an interesting bubble — still walking. I am sure the close air on the top accounts for the bubble that often releases it moving in the Ministry of Defence.

It is a great pleasure to have with us Dr William McKee the Regional Medical Officer of the Wessex Region. He last dined with us in 1976 when the Club dined in Wexley. We have very happy relationships with his Authority and before long we may well be, but handling with them, as we both are, stretched as the rack for resources.

Usually one can barely see the details from this spot but they are here in strength clustered round DMSO. It is a pleasure to have Air Vice Marshal Lane and Major General Rivers with us again this year. And Mr Gubb, Chief Dental Officer of the DMSO and Professor Ilbery.

It is good to have with us Dr Roy Carter representing the Royal College of General Practitioners. And a personal pleasure for me that Professor Stuart Constable, Advisor Radiology in the DASH and our Guest Address in Radiology for many years, is able to be with us.

We are thinner on the ground than in usual times past. From the personal papers I have received to assess the Autumn Travel Season has started earlier this year. But it does have the advantage that tonight we can share all of our company in the body of the Hall. Perhaps this is what at the very of Mrs. Ganser that the founders of the Club intended.

Last year I outlined the true objectives of our Service. And they remain our objectives and I do not need to repeat them.

Admiral Leach has told us recently that today we must look ahead and not behind. And there are not empty words. For a traditional service like our own, hindsight is easier and quicker, but today, hindsight is dead. Well as you know for most of this year, and before the economic pressures of today, were re-emerged, we have been looking and planning ahead on what the Navy needs from its medical service, and what the medical service needs to provide it. In that context it is good to report that the progress on the reconstruction work of the one-link at Harbar. The latest photograph I received shows that the road is in, and it looks like concrete pillars. But there should be good things underneath.

It has been an eventful year since our last dinner. In January the first naval medical officer was appointed to the postgraduate RCMC course which should be of value to the future Surgeon Captain. Major Thompson's powerful back and posture don't change and he is now in the Far East — having drawn the ball out of the raffle. I hope it will be a stimulating stimulus to his next state appointment.

The outstanding professional achieve-

ment for the past year has been the award of the Royal International Association in Urology to Surgeon Commander Beck. Well done. For most of us the word haggles at work of such merit is to produce maximum agreement from a panel of 67 surgeons, experts in this field.

In January we went back to ISM with the Army and R.A.F. Medical Services to the Faculty of Operational Medicine. Sir Richard Bradshaw and Sir Charles Squire each shared a session and it was, I think for those there, last memorable meeting before their retirement. It was an excellent meeting and I am sure we wish them a happy retirement.

In June the new laboratories and building at ISM were officially opened by Sir Desmond Canham on behalf of Her Majesty. It is a sign of the times that the First had to hope what I know would have been a happy task on one of his past personal interests in ISM for a more personal meeting.

After the opening ceremony the Royal opened the 4th Symposium of Naval Medicine on the theme of Operational Medical Support and then stayed on for the first session of that one day and a half meeting. All the papers were by serving medical and dental personnel, and most significantly one RCMC officer on result. Their content was impressive and there range and variety surprised even some serving officers with their eyes perhaps too close to their own guidelines, and wonderfully aware that officers are part of professional and just as busy as other professionals.

The most important event of the year for the future was in July when we at last achieved the first of a series of Workshop meetings with the USN on the vital problems of Combat Casualty Care. Once again Admiral Leachett and his staff are to be congratulated on a well organized meeting. And Surgeon Captain Richardson and Surgeon Commanders Taylor and Dewar. It

was an intensive and productive meeting. The USM sends strong teams including three Royal Admirals concerned with these problems. It was good to meet old friends from the other Navy. Clearly the USM agree that both a philosophy and a policy for medical casualty care is now in required and positively in the RMC environment combined with trauma. They are ahead of us in other medical properties, and training for these medical casualties. Survival is the name of the game — and welcome determination.

There are real problems of great problems and interest and the real reason for our existence that is there then forward in difficult with personal economies. One can only believe the old ideas. Come out and I will put in my head of I may add in St Vincent's advice — to hold with some of solutions.

I suppose with the start of a new term in MED we are back to Europe and the role and role of the defence economies. It seems the Navy will have more people and that would mean that we are well have to have a lot. But with fewer people in the Navy each one will be more important, and one role is caring for their health and preventing personnel effectiveness will be more, not less important. We could manage our resources better. We should have more sea experience, but above all we must maintain our personal clinical experience and training. Anyway my department seems to have these studies well in hand. In essence this without professional care we are of little value, but going in and maintaining it creates our greatest problems. And these are problems we must solve.

However whatever the result of these studies, and whatever of Riphart two important changes we will still have a satisfying professional job to do. I'd like to make it even better and even more effective. And we will still need to recruit, and train, and retain the right things to do it.

Amongst many distinguished senior members of the Club no good to have with us. Sir James Wray, my old boss and the leader in the domain for professionalism in the UK. He is there establishing a special reputation for his academic medical history and researches and Presidency of lately the Medical Society of London and next year of the Royal Society of Medicine.

And it is good to have with us again this year, Sir John, Eardley, tonight with his son, Sir Thomas Eardley, back from his contract in St Vincent.

This year Admiral Good returns in the Ed and I believe he returns shortly from active operational command. I hope he brings out his back soon.

Tonight three old friends appear with us as members for the first time. Commander Murray joins with us with his successor Commander Harper.

And next year Peter Head leaves us to work with the Army in Germany after an outstanding period in Hatter. The Army are lucky to get him with his expertise in ORL. We wish him well in a thank you note for the Navy — supporting the Army.

Admiral Rennie leaves next year at the end of his appointment. Unlike most of us Mike has done many things during his career — and all of them well. He will be sadly missed from our company. We wish him well.

It has been a pleasure to have Commander Johnson and the Admiral Superintendent John Carlin with us tonight. I'd feel sorry to lose John Carlin among us the blood and doctors. Our thanks to them and to the Navy Manager and he will be the excellent dinner.

Well Gentlemen there are uncertain times times of change. We are proud of our professional associations, but we have to use them for practical benefits, and avoid our present 'cups of amaranth'. Perhaps we should leave from the Lawyers.

I am reminded of a story of three

calculus. A private doctor and a lawyer. They were on a small island near my situation looking ahead but happened from it by the fall of sharks with fins showing everywhere. A boat, apparently intact, was lying on the beach of the island. It was clear they would starve unless they could get to the larger island. The private was injured and of course the doctor had to stay with his patient. So eventually the lawyer was persuaded to swim across and get the boat. The doctor dabbed him with shark repellent and the patient and he I guess for him. The lawyer called on the Law Society to protect him during the voyage. Manually the lawyer made it and the sharks seemed to move aside to leave a clear path for him. Thank God — and the patient. My prayers are answered. Not at all and the doctor — doing sharks were just swimming from the usual professional lawyer.

Members of the Club I ask you to rise and drink a toast to Admiral Sir Henry Leach and all our guests.

Admiral Sir Henry Leach, CCB, ADC, CBE of the Naval Staff and First Sea Lord, replied on behalf of the guests:

It is a privilege and a great pleasure to be here tonight and I would first wish on behalf of the guests to express our appreciation for being accepted here and to thank MDC&S for her warm welcome and kind words. I have been briefed to keep my speech short which I will do but perhaps not quite so short as the defendant in a court case which had been underway so that he could be succeeded by the prosecution officer. As the adjutant hearing the prosecution officer reported: Your Worship, I find the defendant to be a man of few words but he gave us the benefit of two of them.

I am also reminded of Lord Justice Bingham who when addressing the Law Society said that he had given the same speech some time ago to members of Wardsworth Prison but that he hoped

perhaps some of them of you will have heard me before when I had the honour of being invited on this occasion in 1975 to CHURCHILL.

Some of you will be aware that at the entrance to the new Institute of Naval Medicine Buildings in Gosport is a plaque which reads: Institute of Naval Medicine — opened by — Admiral Sir Henry Leach etc. — on 8 June 1981 — for the promotion of health and personnel effectiveness in the Fleet. Regrettably I have to tell you that I was unable to see Gosport on the 8th or any other day in June. The Gibraltar Review was at its lowest and I, kindly deposited for me that I have since made several and rounded the Institute to be updated on its various tasks in the human factors and research fields and in environmental underwater and survival medicine. These are areas of great importance to the future of maritime operations as the emphasis moves towards under spending longer periods in confined spaces, not only in submarines and aircraft but also in surface ships. I most heartily commend this company that medicine is not just about saving but also about prevention and naval medicine is well up the front in the frontiers of oceanic submarine and diving survival and safety as the frontiers of knowledge in these subjects are extended and explored.

It is not all that long time ago when most nations died from disease then from fighting the enemy and the hazards of the sea. This applied particularly to the defeat of the Spanish Armada and later in the West Indies where many of the wars by which our national maritime supremacy was won were largely fought. The task has been the reconstruction of memory on the biography and on strategic aspects of naval history that comparatively little serious historical attention has been paid to the effects of the dramatic and unpleasant of these times.

Indeed it was not until the late 19th

convoy that there was something of a medical revolution in the Navy led by a select band of great professionals. These five dedicated and talented men applied themselves not just to the curing of disease but also to the cause. They worked hard to improve the hygiene in ships and did much to correct the dietary deficiencies and improve the standards of recruiting. The Admiral President might be expected to know that the ship's surgeon in those days carried considerably more status and power onboard than the ship's doctor. I will not venture an opinion on how they stand today. As Nelson later put it: "The great thing in all military medicine is his life."

My himself took a close interest in the health of those under his command and it is interesting to note that on the morning of the Battle of Trafalgar, Napoleon's sick list had only ten occupants; the remainder of the 60-ship's company were all in good health which was remarkable, bearing in mind the conditions onboard in those days.

But I couldn't help feeling a little wrong the other day when I read the list of equipment which a ship's Assistant Surgeon then had to provide — at his own expense please note. It included two pint gastric syringes, screw for removing bulk part of bone supports and incisors, two engines and two anastomosis, — whatever they are. As we have now finished eating, I am happy for one of you to explain them to me. And finally — and this is where I stopped reading — I saw for the first

time enough of the past. How much the Naval Medical Service today? Of course, I include in that all embracing name our Dental Service, our Nursing Service, our Reserves and our Civilian Consultants and Advisors, to whom we owe so much and some of whom I am very glad to see here

tonight. We in the Navy are I believe right up to the hilt with these fields and it is highly important that we should keep so. There are problems of course, but diseases, even are fatal problems and they are highly skilled in getting round them. I remember talking to a very able Naval surgeon a few years back, shortly after he had successfully run me up. I discussed the problem of drinking for a surgeon, comparing it with that for the captain of a ship at sea, or the pilot of an aircraft. The common factor was that life was at stake. He assured me that the analogies did not really apply to surgeons because if they made a mistake, there was always an alternative way out of the problem without endangering the life. I was relieved that this conversation took place after the operation!

Finally a few words about the future. I don't wish to spoil such a pleasant evening by dwelling on the outcome of the recent General Review and my impact on the Navy in general or our Medical Service in particular. I would be dishonest if I was to say I was happy with the results. I imply no disapproval in saying that and have expressed it in the highest places. Nevertheless the Government has made no decision — though there is still a certain amount to play for — and it is now our duty to implement them as best we can. We under no circumstances the Navy is being severely cut and certainly nothing will change including I am bound to say the Naval Medical Service. The money now to apply cuts tends to be that of ships and weapon systems, not without them — the Royal Navy — there is no point in having a Navy. So we must make the biggest cuts we sensibly can in the training and support services. How this will affect the Naval Medical Service I cannot put, say, it is still too early but is being urgently studied. What I can tell you is that I personally am fully committed to the importance of having a viable — and I use that word deliberately — a viable Naval Medical Service. In my

¹ *Caddy* — a ship, short period, double edged tool used in carpentry etc.

Trajectory — a path of a body that, put in a straight line, the path of an object and of an object in the air of a body through a vacuum. Ed

view that it is a *last* and not an *first* effective fighting service. We must never forget that if we wish to continue to enjoy the high quality men and women that the Navy has come to expect, we must provide them with a good assurance that whatever the special moral circumstances in which they may be required to work they can depend on prompt and expert medical support. The guarantee and the look-alike take these things for granted, and it is no use.

It is time I stopped. As there are so few before persons, you are unlikely to make the jump you wish to performance doctor from of some did recently, at a cocktail party. A lady came up to him and said: "You remember me, don't you?" To which he

replied, slightly flustered: "Thinking she was a common person. I remember your face but what else was wrong with you?"

Let me end on a note of confidence. We are about to reshape our efforts for a smaller Navy, but in all respects that is in the very best way can afford and that standards are kept up. The transition will not be easy and some hard decisions, having far reaching effects on the future will need to be taken, we must get them right.

Lady and Gentlemen, it is my privilege to give you the final word of the evening. I wish you to wish and wish to the health and future prosperity of The Royal Navy Medical Club.

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Surgeon Lieutenant W. A. L. Marshall R. W.
Pemberton

Surgeon Vice Admiral Sir John Beallley RSCC has
been appointed Director of the new Cardiology Unit,
Queen Elizabeth Hospital.

Surgeon Vice Admiral Sir James Watt RSCC RSCC has
been appointed Director of the new Cardiology Unit,
Queen Elizabeth Hospital.

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

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Miss P. W. Marshall, Miss P. W. Smith

To Senior Nursing Officer
Miss S. J. Knight, Miss P. B. Macdonald, Miss J.
M. Martin, Miss J. A. Taylor

To Nursing Officer
Miss J. B. Clark, Miss J. J. Carter, Miss P. F. Lee

New Nurses
Nursing Officer, Miss J. Smith

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To Lieutenant
R. J. Smith

To Acting Lieutenant
R. J. Smith

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Lieutenant Commander, R. J. Smith

Acting Senior Medical Officer, R. J. Smith,
R. J. Smith, R. J. Smith

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Abstract

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